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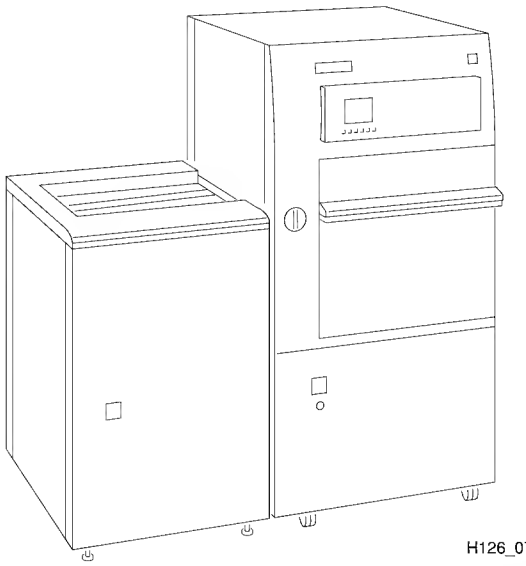
User's Manual for the *Kodak Ektascan* 2180 Laser Printer and the *Kodak X-Omat* 180 LP or 180 LPS Processor



HEALTH SCIENCES DIVISION

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Section 1: Safety Information for the *Kodak Ektascan* 2180 Laser Printer

Because the imaging sections of laser printers (imagers) are designed differently, the printed image size displayed on film (media) will differ among models of laser printers. External measuring devices such as templates, scales, rulers, or reference point charts used for charting anatomical locations or measuring point to point should not be used in the diagnosis or treatment of patients unless differences among the printed image sizes of laser printers has been taken into consideration.

Read and understand all instructions before using.

The *Kodak Ektascan* 2180 Laser Printer is a Class I device. This means that for protection of the user against electrical shock, this device relies on a proper ground connection as outlined in the Site Specifications for the *Kodak Ektascan* 2180 Laser Printer.

Warning

This device has not been designed for:

- direct patient contact.

  It must not be used within an eight foot radius of an immobilized patient.

- use in an explosive environment.

  It must not be used in areas where explosive gases or vapors are present.

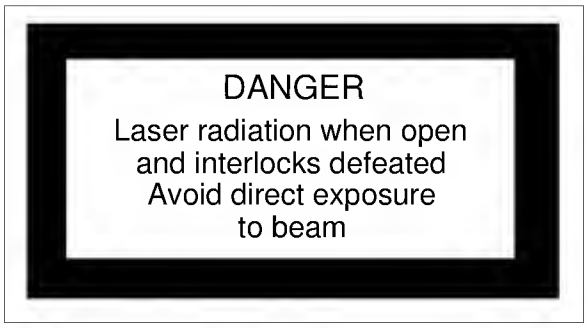
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Caution

This device is intended for use only by professional, trained personnel.

Note

Noise Emission is less than 70 dBA.



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Warning

DANGER, AVOID *LASER* BEAM. THIS EQUIPMENT USES A VISIBLE RED *LASER*. *LASER* RADIATION CAN BE PRESENT WHEN THE MACHINE IS OPERATED WITH THE PANELS OFF AND THE INTERLOCKS DEFEATED. AVOID DIRECT EXPOSURE TO THE *LASER* BEAM.

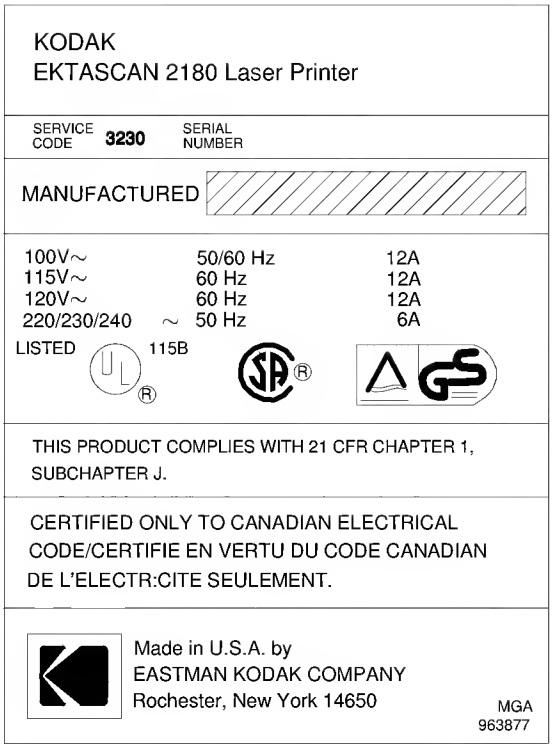
DANGER, HIGH VOLTAGE.

This equipment is operated with hazardous voltage which can shock, burn, or cause death. Remove the wall plug before servicing equipment. Never pull the cord from the outlet. Grasp the plug and pull to disconnect. DO NOT operate equipment with a damage power cord. Position the power cord so that it will not be tripped over or accidentally pulled.

Caution

DO NOT use an extension cord to power the Laser Printer. Connect this equipment to a grounded outlet. Refer to the Site Specifications for the *Kodak Ektascan* 2180 Laser Printer and the *Kodak X-Omat* 180 LP or 180 LPS Processor for additional details.

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference with radio communications. It has been tested and found to be exempt from the limits for a Class A computing device pursuant to Part 15, Subpart J of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential environment is likely to cause interference, in which case the user, at the user's own expense, will be required to take whatever measures may be required to correct the interference.



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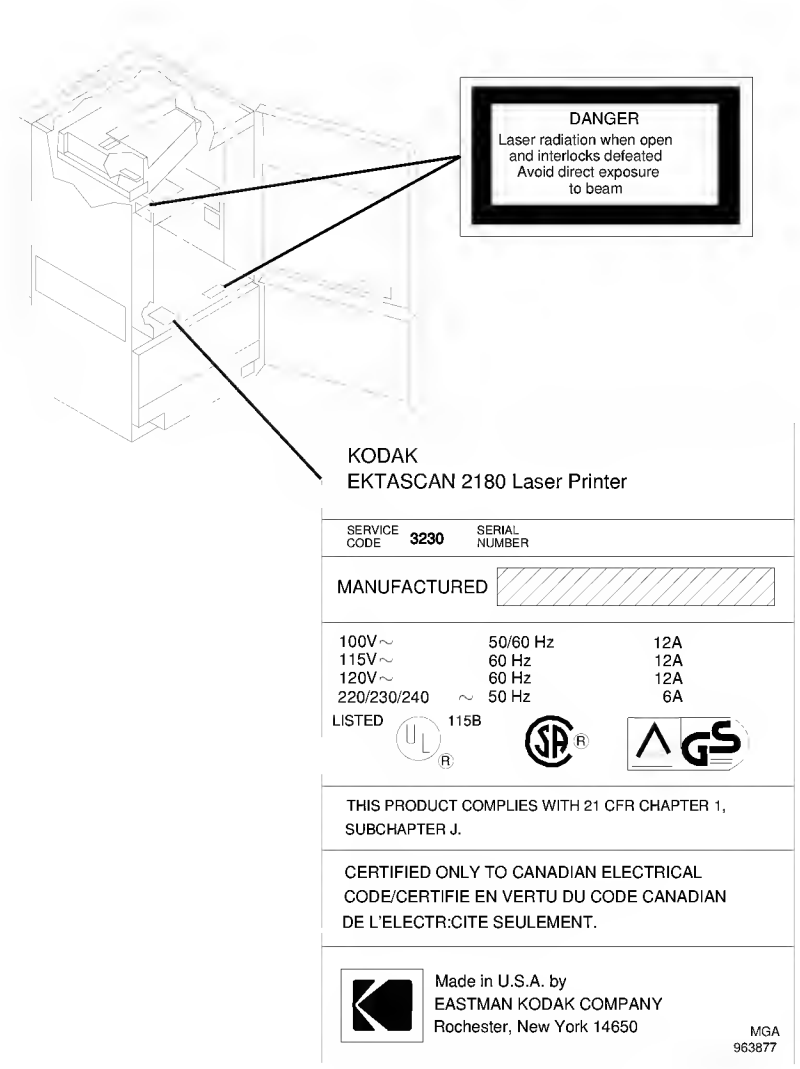
This device complies with the RFI requirements of VDE 0871, Class B.


DANGER
Laser radiation when open
and interlocks defeated
Avoid direct exposure
to beam
KODAK
EKTASCAN 2180 Laser Printer
SERVICE CODE 3230
SERIAL NUMBER
MANUFACTURED
100V~ 50/60 Hz 12A
115V~ 60 Hz 12A
120V~ 60 Hz 12A
220/230/240 ~ 50 Hz 6A
LISTED 115B
THIS PRODUCT COMPLIES WITH 21 CFR CHAPTER 1, SUBCHAPTER J.
CERTIFIED ONLY TO CANADIAN ELECTRICAL CODE/CERTIFIE EN VERTU DU CODE CANADIAN DE L'ELECTR:CITE SEULEMENT.
Made in U.S.A. by
EASTMAN KODAK COMPANY
Rochester, New York 14650
MGA
963877

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Cleaning and Sterilization:

The *Kodak Ektascan* 2180 Laser Printer is not to be cleaned by immersion nor sterilized by *autoclaving*. Do not wash in a manner allowing fluid to flow freely over the external services. To properly sterilize or clean:

- power down the unit.
- immerse a clean, soft cloth in an appropriate non-abrasive, non-corrosive sterilizing or cleaning solution.
- wring cloth to remove excess fluid.
- wipe the external surfaces free of soil.

Exercise caution around openings and electrical connections. When soil is removed, wipe external surfaces dry with clean or sterile soft cloth.

Responsibility of the Manufacturer:

The manufacturer is responsible for the effects on safety, reliability, and performance of the *Kodak Ektascan* 2180 Laser Printer only if:

- assembly operations, extensions, readjustments, modifications or repairs are carried out by persons authorized by the manufacturer.
- the electrical installation of the relevant room complies with the appropriate requirements.
- the *Kodak Ektascan* 2180 Laser Printer is used in accordance with the instructions for use.

Note

Please refer to the *Kodak Ektascan* 2180 Laser Printer and *Kodak X-Omat* 180 LP or 180 LPS Processor site specifications for installation and site preparation information.

Section 2: Printer Overview

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About This Manual 3

The User's Manual provides instructions for using all features of the *Kodak Ektascan* 2180 Laser Printer and *Kodak X-Omat* 180 LP or 180 LPS Processor. Refer to the manual when using the 2180 Laser Printer to become familiar with the proper operating procedures. Before using the system, read each section carefully.

Sections 2 - 8 of this manual are devoted to the operation of the *Kodak Ektascan* 2180 Laser Printer. Section 9 is a Quick Reference Guide to aid when using the Keypad and to show the flow of the Operator Interface Screens. Sections 11 - 17 discuss the operation of the *Kodak X-Omat* 180 LP or 180 LPS Processor.

The Appendices located behind the Appendix tab at the back of the manual contains the following:

Appendix A Setting Up Supply Magazines

Appendix B Folding the Reusable Plastic Carrier Board

Appendix C Warranty Statement for the Processor

Appendix D Processor Menu Flow Chart

Appendix E Processor Error Messages

Words that are *italicized* can be found in the Glossary, which follows the Appendices.

An Index of alphabetized topics is included at the end of this manual.

Manual Organization

This manual consists of the following sections:

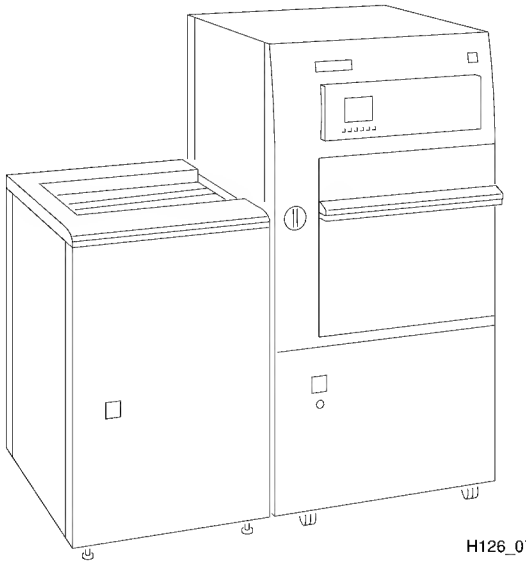
- Section 1 - **Safety Information** provides important safety information and warnings for all users.
- Section 2 - **Overview** provides a general description of the Printer and Processor, what they do, and how they do it.
- Section 3 - **Basic Operations** explains how to start up and shut down the equipment, how to select film, how to load and unload film in the Printer, and how to monitor the Printer status at the Control Panel.
- Section 4 - **Keypad Functions** explains how to use the Keypad to store, print, and delete *images*, and how to use the *Control Terminal*, Footswitch, *Auxiliary Keypad*, and *tone scaling*.
- Section 5 - **Control Terminal** explains how to use this feature to supplement *autofilming* or Keypad features for devices that send commands to the Laser Printer.
- Section 6 - **Calibrating the 2180 Laser Printer** explains how to *calibrate* the Laser Printer.

- Section 7 - **Study Reprinting** explains how to use this feature which allows you to reprint original patient studies after the patient has left the imaging area.
- Section 8 - **Troubleshooting and Error Messages** explains how to clear film jams in the Printer and Processor, how to perform routine maintenance, how to maintain the *Densitometer*, and how to interpret error messages and interact with Kodak support personnel when necessary.
- Section 9 - **Quick Reference Guide** provides information when using the Keypad and a flow chart of the Operator Interface Screens.
- Sections 10-15 **- *Kodak X-Omat* 180 LP or 180 LPS Processor** provides Processor information.
- Section 16 - **Using a 21-Step Gray Scale for Processor Quality Assurance** explains procedures related to processor quality assurance.
- Section 17 - **Sorter** provides information on how to use the *Sorter* and how to clear film jams.
- Section 18 - **Appendix** includes several Appendices which provide additional information, such as Error Messages, Setting Up Supply Magazines, and Ordering Information.
- Section 19 - **Glossary** provides definitions of terms and acronyms that are used in this manual.
- Section 20 - **Index** provides key words and phrases to help you find information quickly.

General Product Overview

The *Kodak Ektascan* 2180 Laser Printer prints high-quality, hard copy films of medical *images* using *Kodak Ektascan* HN or HNC laser imaging film. It is part of a diagnostic imaging system, and accepts medical *images* from multiple *imaging devices*. The *Kodak Ektascan* 2180 Laser Printer is designed to be integrated with the *Kodak X-Omat* 180 LP or 180 LPS Processor. Also, a Receive Magazine could be used instead of the 180 LP or 180 LPS Processor. The roomlight film package allows the user to load film into two different Supply Magazines under normal room light conditions.

The 2180 Laser Printer and the 180 LP or 180 LPS Processor are both controlled through the Control Panel and the Keypad for the Laser Printer.



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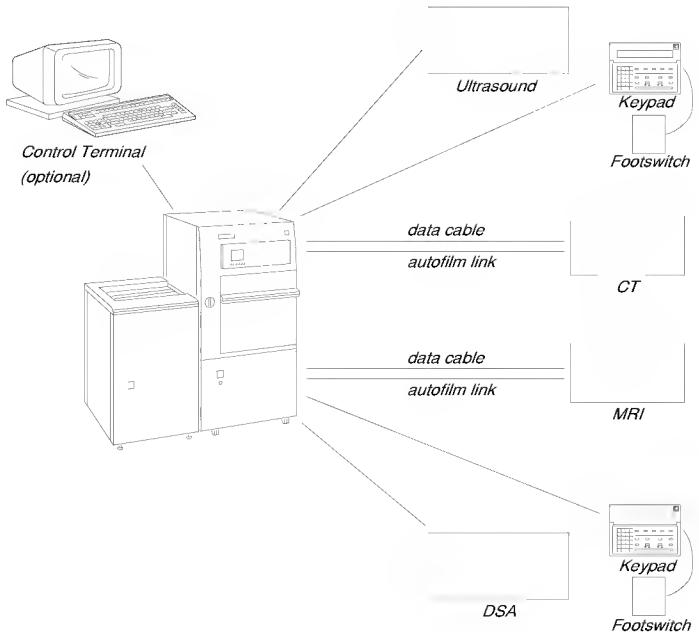

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System Configuration Example

The above illustration shows a typical system configuration. The Laser Printer can receive video and digital *images* from 6 to 8 *imaging devices*. Storage of images and other input-specific parameters can be controlled either by the Keypad or by autofilming commands from the imaging device. In Keypad Mode, a Footswitch may also be used to store images. In Autofilming Mode, a Control Terminal or an Auxiliary Keypad may be used to access features of the Laser Printer not supported by the autofilming connection.

What the System Does

An *image* of a patient is captured, and the user selects the format and requests a copy of that *image* on film by...

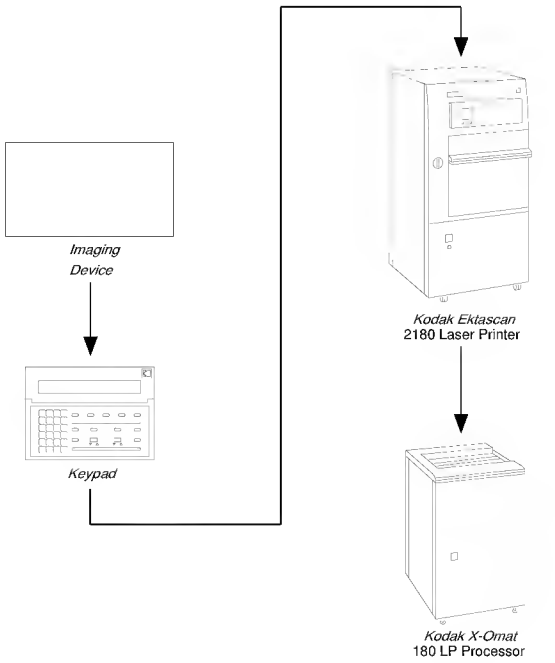
pressing [Print] on the Keypad (or on the imaging device console with *autofilming*) or using *autoprint*.

The Laser Printer receives the *image* electronically...

to be exposed onto film in the Laser Printer.

If a Processor is attached, the film is sent to be processed.

Otherwise, you would select Receive Magazine for the film to be sent to a Receive Magazine and processed later.



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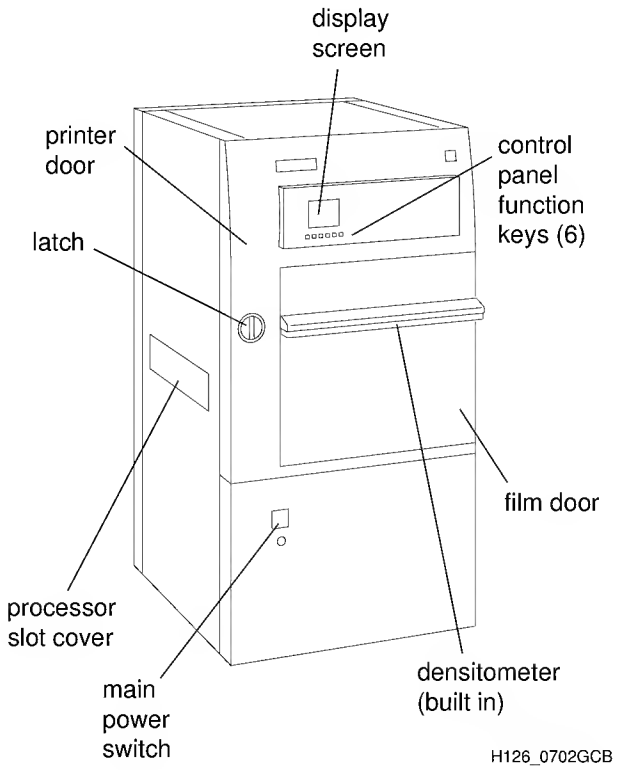
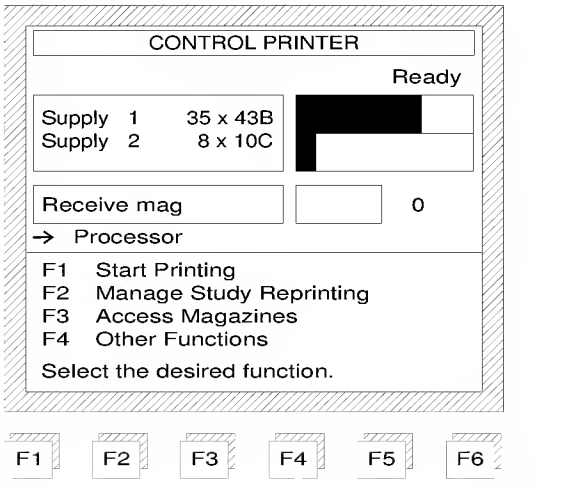
Printer Overview



Display Screen Overview

The following information briefly describes the information that is shown on the Display Screen on the Laser Printer.

The general *screen* format is:



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The *screen* is divided into two sections. The top half of the *screen* is the Data Section and the bottom half of the *screen* is the Command Section.

In the Data Section, the Printer provides you with information such as the *screen* title, the printer state, and *screen*-specific data. In the Command Section, you can select commands and the Printer *prompts* you for your next action.

Data Section

The following information is provided on the Data Section part of the Display Screen:

- *Screen* title, shown in *reverse video* (which is at the top of the Display in the highlight bar).
- Printer state - "Printing," "Not printing," "Ready," "Testing," or "Offline."

  "Printing" - the Printer is in the process of printing films from the Print Queue.

  "Not printing" - the Printer has stopped printing films from the Print Queue. Any *pages* that are already in progress will finish printing.

  "Ready" - the Printer is ready to print, but the Print Queue is empty.

  "Testing" - the Printer is not printing films from the *imaging devices*, but is printing test films or transporting films.

  "Offline" - the Printer is not accepting commands or data, and is not printing films from the Print Queue. The Printer is off-line during power-up diagnostics, after certain errors, and when diagnostics are run by Service Representative. Turn the Printer off and on to clear the Printer and return it to a ready state.
- *Screen*-specific data. The *screen*-specific graphics and text that are displayed on the top half of the *screen* are updated constantly to report machine status. In some cases, you may select data item(s) in this section, or when the *screen* is displayed, some items may be selected by *default*. Selected items are displayed with a reversed selection box.

Command Section

The following information is provided on the Command Section part of the Display Screen:

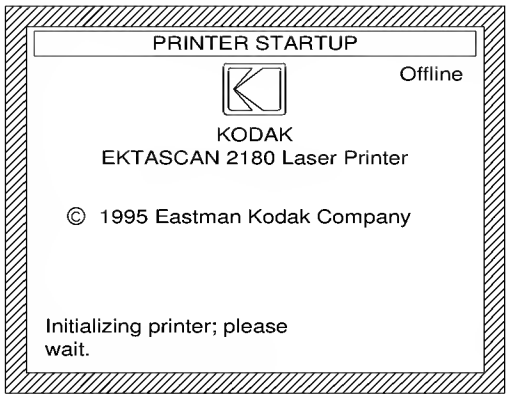
- Up to six commands, consisting of a key label and descriptive text. You may perform any of the commands that appear on the *screen* by pressing the appropriate function key, such as [F1], [F2], or [F3].
- A context-specific *prompt* to guide you or ask you for input for your next request.

Not all commands are appropriate in all situations. If a command is not appropriate in a particular situation, it is *cleared.* When a command is *cleared,* the descriptive text of the command is not visible. If a *cleared* command becomes appropriate again, the Printer displays the descriptive text line of the command again. In this case, the command is said to be *enabled.*

Some commands *toggle* between two values. For example, in the Control Printer Screen, command [F1] *toggles* between "Start Printing" and "Stop Printing."

Printer Startup Screen

The Printer displays this *screen* when the Printer is powered up. The Printer initially displays this *screen* with the *prompt* "Initializing printer; please wait." While the Printer is recovering print jobs, the prompt will change to "Recovering print jobs; please wait." (With the Image Buffer feature, the Printer will reprint pages that were stored but not printed due to a power down situation.) After print jobs are recovered, the prompt returns to the initial prompt as displayed.



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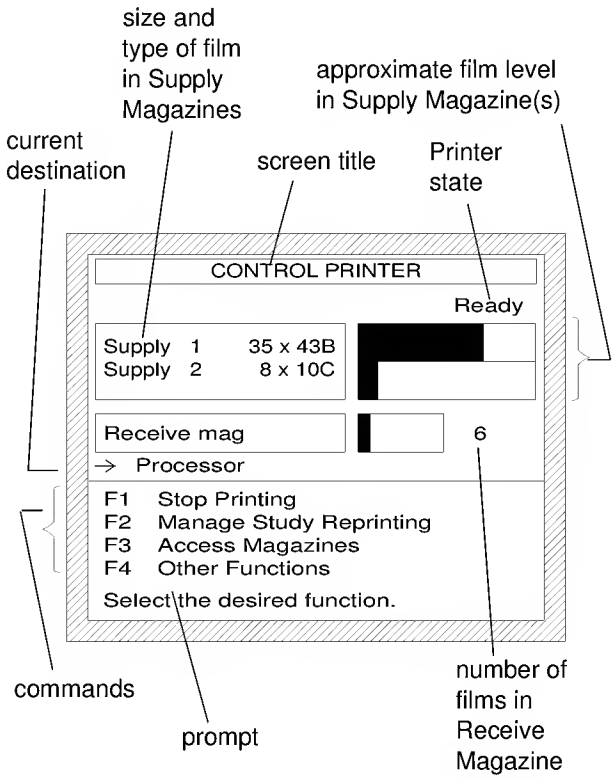
When all startup diagnostics are successfully executed, the Printer displays the Control Printer Screen. The Printer state will be either "Ready" or "Printing."

If there are any diagnostic failures, the Printer will display the Error Recovery Screen.

Control Printer Screen

The following *screen* will be displayed most of the time during normal operation.

Display Screens will be discussed in more detail in "Using the Control Panel" of Section 3.



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Keypad Overview

The following information explains the basic functions of the Keypad that can be used with the Laser Printer.

The Keypad is a device that allows the user to enter commands which control the storing of *images* and the subsequent printing of those *images*. Each Keypad is independent and may be used to select parameters that are specific to that *imaging device*. There can be up to eight Keypads on a system, and they can be located up to 60 meters (197 feet) away from the Laser Printer or Processor. With an optional cable extension, the Keypad may be located up to 280 meters (919 feet) from the Laser Printer.

There is a Keypad for each input, except inputs using an autofilming link. With an autofilming link, commands are sent from the imaging device.

Note

Some autofilming links do not accommodate all features available on the Keypad. These features may be implemented by using the optional Control Terminal or the Auxiliary Keypad. (The operation of the Control Terminal is explained in the user information shipped with the Control Terminal.)

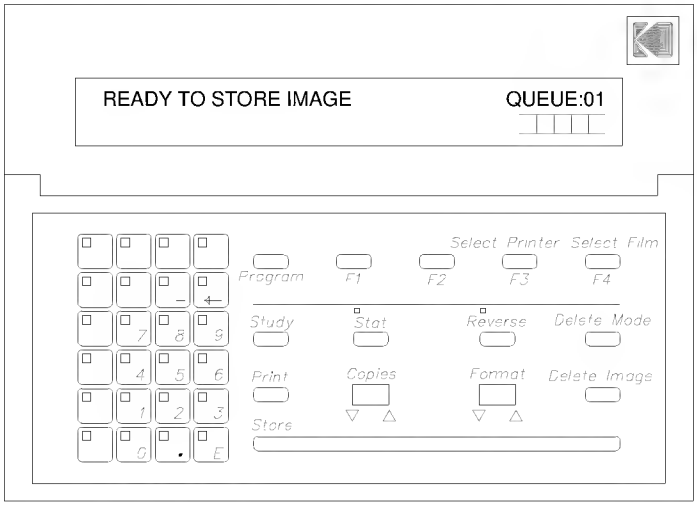
The fold-out "Quick Reference Guide" illustration of the Control Panel and Keypad may be extended and positioned beside this information to help locate specific items being described. See Section 9 for this Guide.

The Keypad consists of a message display, a numeric keypad (which also functions as an indicator of image store positions), four function keys (F1 through F4), a number of dedicated function keys for such activities as printing and deleting, a [Store] bar, and [▲]and [▼] keys to increase and decrease the number of copies and format selections.

Each item is explained briefly below. More complete explanations of specific key functions are located where the function is fully explained.

Note

If a particular feature or key is not available at the time it is pressed, the "Invalid Key" tone sounds.



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The Keypad and complete explanations of specific key functions will be discussed in more detail in Section 4 "Keypad Functions."

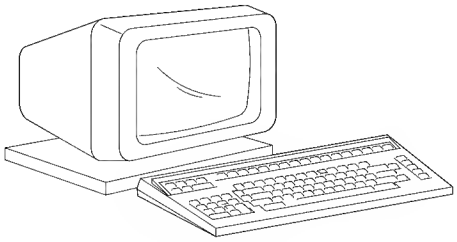
Footswitch Description

The Footswitch connects directly to the back of the Keypad. Pressing the Footswitch stores an *image* just like the [Store] bar on the Keypad stores an *image* (left to right, top to bottom).

Control Terminal

The *Control Terminal* can be used to substitute or supplement existing *autofilming* or Keypad features for any device that sends commands to the Laser Printer.

The *Control Terminal* and its features will be discussed in detail in Section 5 "Control Terminal."



Control Terminal

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Section 3: Basic Operations

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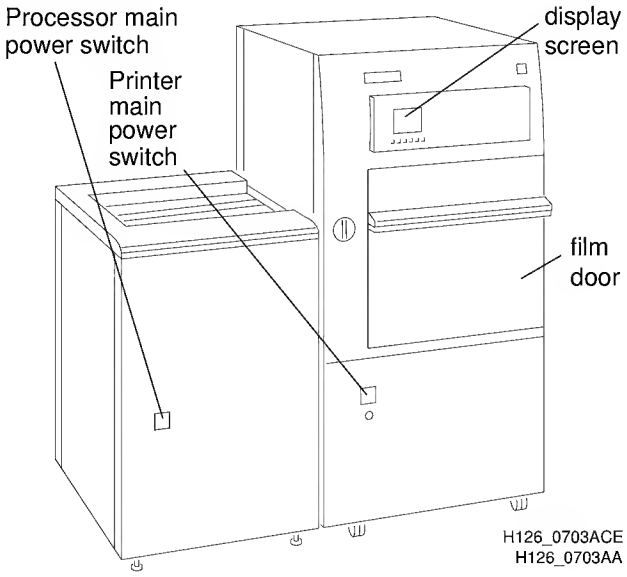
Start-Up and Shutdown

Start-Up

[1] If a Processor is attached to the Laser Printer, see the procedure in Section 14 of Part II of this User's Manual to start-up the 180 LP or 180 LPS Processor.

[2] Turn on the main power switch for the Printer.



Note

If the [Print] command is used to print an *image* before the solutions in the Processor have reached the correct temperature, the Printer displays a message that the Processor is not ready. The films will remain in the *Image Buffer* until the Processor becomes ready.

(You may override the message and send the film to the Processor by using the override function on the Printer Control Processor Screen. See "Control Processor Screen" in Section 11 of Part II of this User's Manual for more information.)

There are no films waiting in the print queue if the Printer Display Screen shows the Printer state as "Ready."

Shutdown

[1] Wait for all films to be printed. There are no films waiting to be printed if the printer state in the upper right-hand corner of the Display Screen is "Ready."

Note

With a docked Processor, the Control Printer Screen indicates that films are printing in the upper left-hand corner.

[2] Once the Laser Printer is turned off, the Film Door will not open. Therefore, it is necessary to remove and empty the Receive Magazine, before the Laser Printer is turned off.

[3] If a *Kodak Ektascan* Network Interface is installed in the Laser Printer, refer to the shutdown procedure for the Network Interface located in the User's Guide for the *Kodak Ektascan* Network Interface for Laser Printer Interconnect.

[4] Turn off the Printer by moving the Main Power Switch to the "OFF" position.

[5] If a Processor is attached, see the shutdown procedure of the Processor in Section 14 of Part II of this User's Manual.

When the 2180 Laser Printer is turned off (or a power failure occurs), system configuration and *interface* option information is saved.

Any films that were in the print queue waiting to be printed will be printed when the power is restored. (You can look at the Print Queue Screen to see the source, *pages*, total films, and status of the studies in the Print Queue. If no films appear in the Print Queue, then the *images* must be restored from the *imaging device* again.) The Print Queue Screen and Print Queue information will be discussed in detail later in this section.

Selecting Film

Overview

The [Select Film] key on the Keypad allows you to select or change the film size or type that is used by the *imaging device*. The *Control Terminal* or *Auxiliary Keypad* may be used to select film for *autofilming imaging devices*.

There are two film types (blue base and clear base), and four film sizes for the 2180 Laser Printer:

- 8 x 10 inch
- 11 x 14 inch
- 35 x 35 cm
- 35 x 43 cm

Note

The Supply Magazines in your Printer are set up and labeled for the film sizes and types that will be used at your site. If your site changes the film sizes or types that are used, contact your Service Representative or see Appendix A of this manual for instructions to change the Supply Magazines setup.

Important

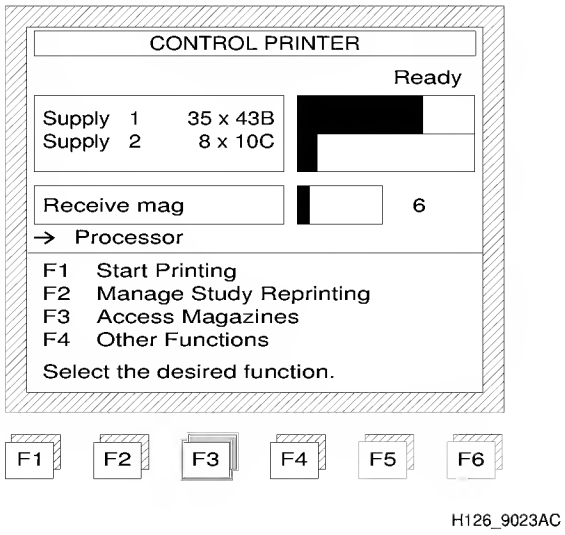
You can select a film size and type even if it isn't currently in the Printer. The films will be held in the *Image Buffer* until the appropriate film size and type are loaded and set up in the Printer.

The Supply Magazine can hold 100 sheets of roomlight-load film and 103 sheets of darkroom load film.

Loading and Unloading Film

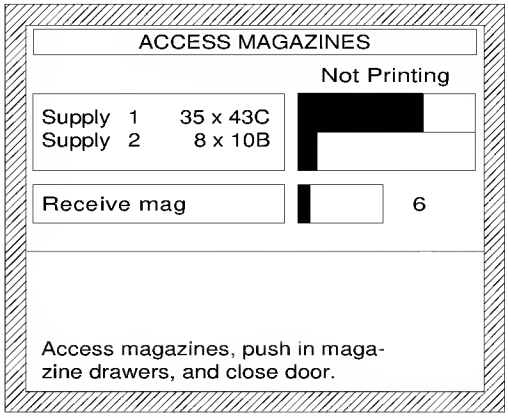
Overview

To load or unload film in the Laser Printer, select [F3] Access Magazines from the Control Printer Screen.



H126_9023AC

Access Magazines Screen

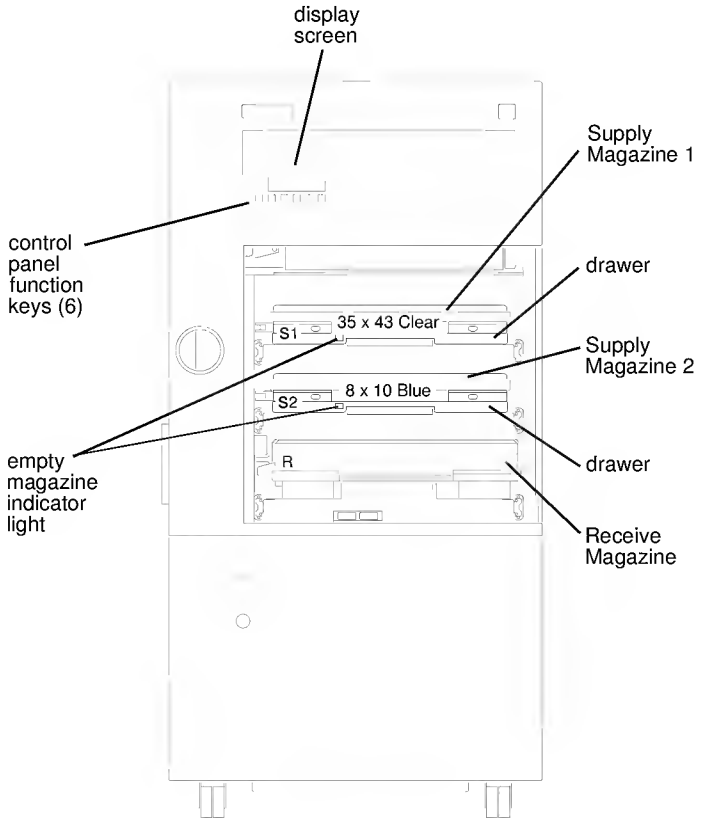


H126_9024AC

When this *screen* appears, the Printer will:

- check to see if work is in progress. If so, the Printer displays a message, "Work in progress; please wait."
- automatically unlatch the Film Access Door.
- indicate with a yellow indicator that the Supply Magazines are empty. See the following illustration.

You may now open the Door fully and pull out one or more Magazine Drawers to remove, load, or unload one or more Magazines.


display screen
Supply Magazine 1
control panel function keys (6)
drawer
S1
35 x 43 Clear
Supply Magazine 2
S2
8 x 10 Blue
empty magazine indicator light
R
drawer
Receive Magazine

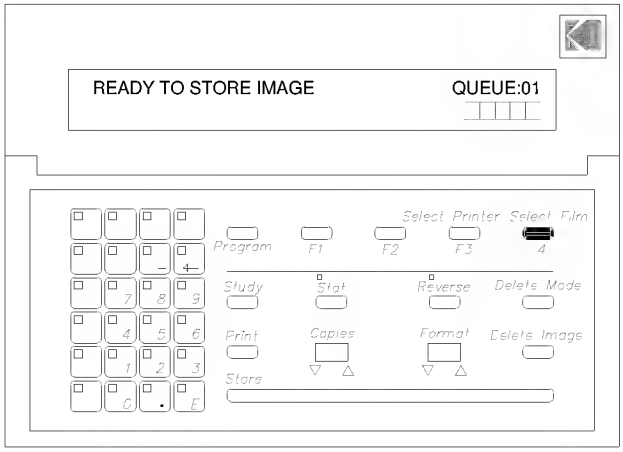
H126_0712DA

Changing Film Size

To change the size of film used, you must

[1] Load the new film into the Supply Magazine.

[2] Insert the Magazine into the Printer.



H126_2714BC

[3] Select the new film size at a Keypad. If you are using the *autofilming option*, you can select the new film size at the *Control Terminal* or *Auxiliary Keypad*.

(a) Press [Select Film] on the Keypad.

Note

The *default* film size is 35 x 43 cm blue base.

(b) Press [F1] to scroll through the 4 possible film sizes and 2 possible film types. If a film size is available, the size displays. If it is not available, the display will show the size and base type and "not present" for that film.

(c) When the desired film size displays, press [F2] to select it.

(d) Store and Print *images*.

Loading Roomlight Film in the Supply Magazine

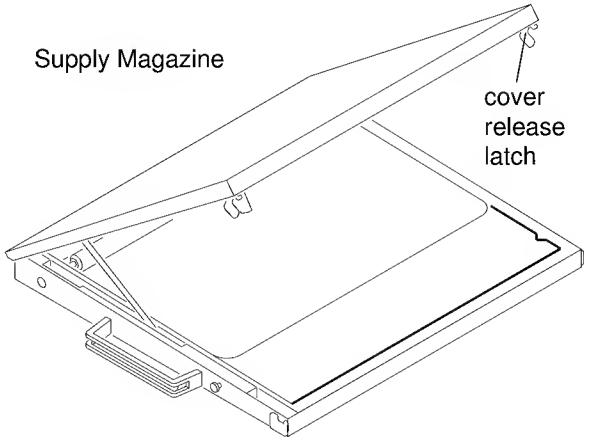
Film is stored in one of two Supply Magazines before it is used for printing *images*. Each Supply Magazine will accept only one film size at a time. The Supply Magazines Drawers are marked **S1** and **S2** to differentiate them from the Receive Magazine Drawer, which is labeled with an **R**.

You do not need to remove the Supply Magazine from the Printer in order to load roomlight film.

Follow these steps to load the roomlight load film in the Supply Magazine:

[1] Check the empty Magazine indicator lights on the front of the Supply Magazine Drawer or the display on the Control Printer Screen to determine which Supply Magazine is empty.

[2] Pull out the Drawer of the empty Supply Magazine and open its Lid by lifting the Cover Release Latches on the 2 front corners of the Supply Magazine until the Lid latches on the supporting arm.



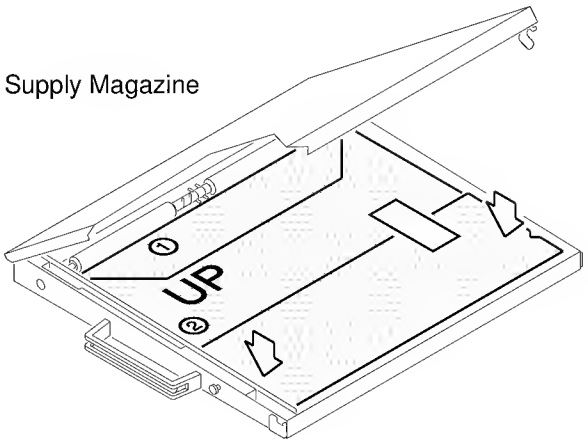
H126_0024ACA
H126_0024AA

[3] Remove the old white cardboard and discard it.

[4] Remove and discard the empty film pouch.

[5] Make sure you have the proper film for the Magazine.

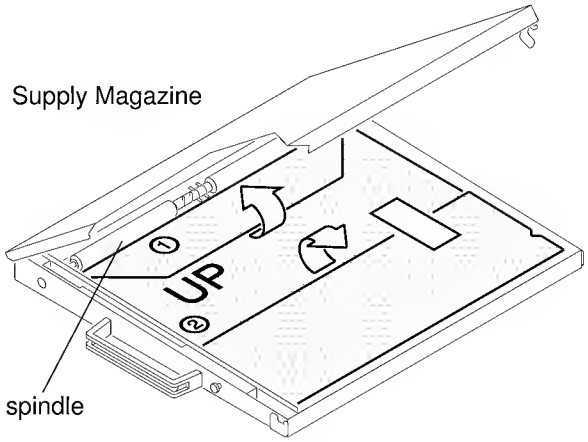
[6] Place the new film package into the Magazine, checking that the side labeled "UP" is facing up as illustrated below and that the package is fully seated in the Magazine.



H126_0005ACA
H126_0005AA

[7] Lift flap 1 and place it over the teeth of the Spindle at the back of the Magazine. These teeth will engage to pull the film package off of the film.

[8] Remove tape and fold out flap 2 as numbered on the film packaging and in the illustration below.

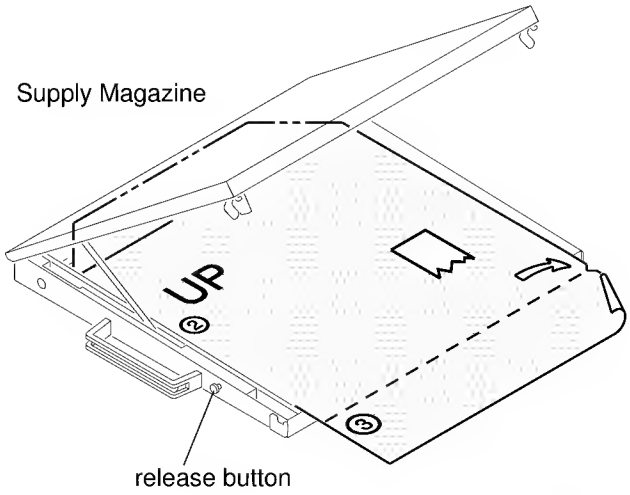


H126_0006ACA
H126_0006AA

[9] Close the Magazine Lid by lifting the Release Button on the left-hand side of the Supply Magazine, lowering the Lid, and pressing on the Magazine Lid until it latches on both sides.

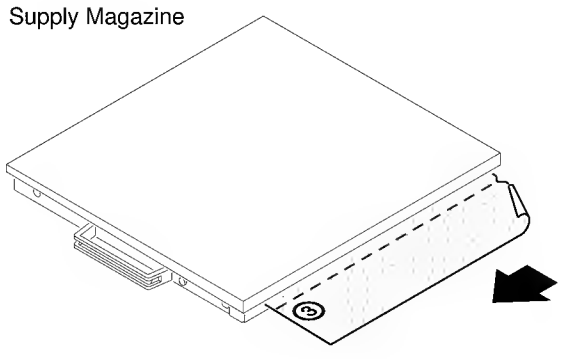
Important

Do not put weight on the Supply Magazine. This will result in damage to the Drawer.



H126_0007ACA
H126_0007AA

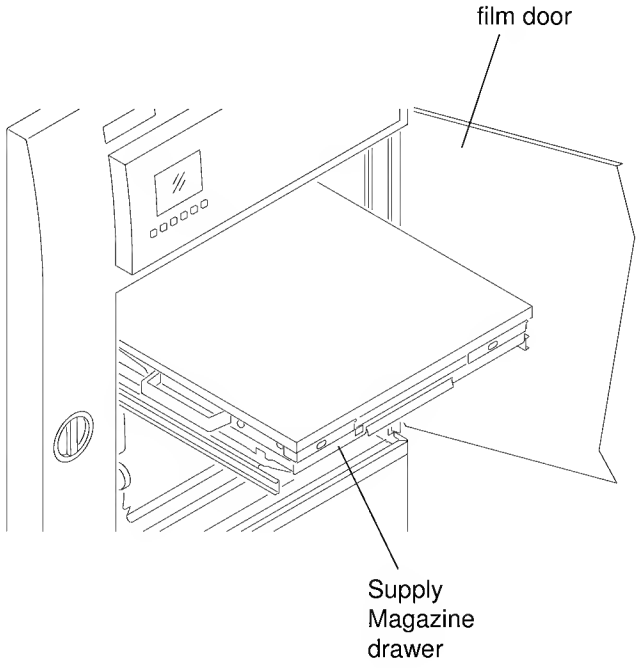
[10] Remove flap 3 at the notch as indicated on the film packaging and in the illustration below. About 1 in. of the film package will hang out of the front of the Supply Magazine. The package will be wrapped up by the Spindle in the Supply Magazine.



H126_0010ACA
H126_0010AA

[11] If you removed the Supply Magazine from the Supply Magazine Drawer, return it to the appropriate Supply Magazine Drawer in the Laser Printer.

[12] Push the Supply Magazine Drawer all the way in until it latches and close the Film Door of the Printer.



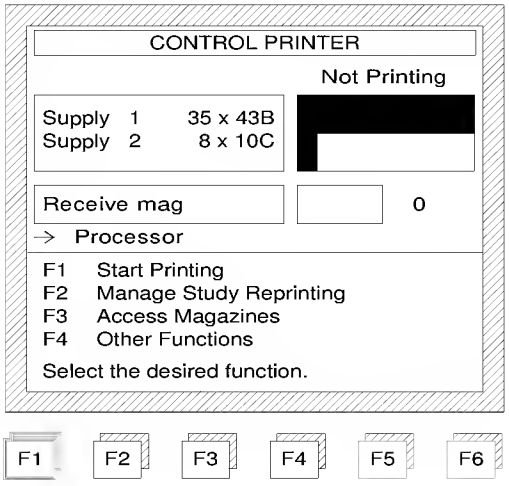
H126_0717GCA
H126_0717GA

[13] The operator has the option of pressing [F1] at the Control Panel to start printing or to access other features. These features include the calibration or the transport of the film through the Printer to the docked *Kodak X-Omat* 180 LP or 180 LPS Processor. If none of the options is selected within a preset time delay, the Printer will automatically start printing.

Note

The time delay (1-60 seconds) is configured at installation.
A motor will remove the package from the film.

The Printer will become Ready and the Display Screen will indicate that the Supply Magazine is full of film.



H126_9025AC

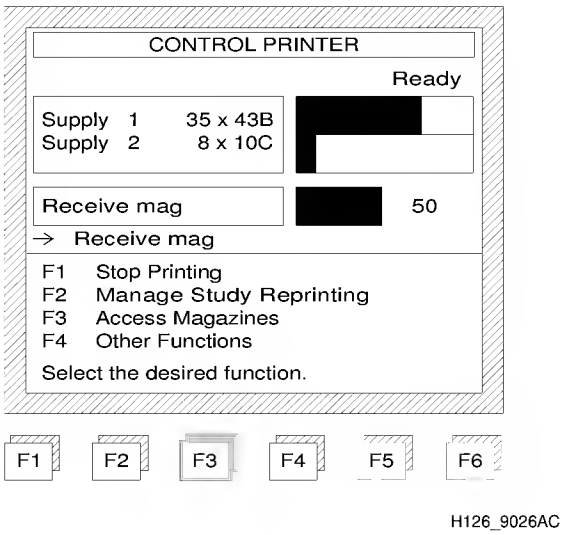
Unloading Film from the Receive Magazine

The following is a summary of steps for unloading film from the Receive Magazine.

Note

Do not wear shoe types or clothing materials that might cause static, such as rubber sole shoes or nylon materials.

[1] Select [F3] Access Magazines from the Control Printer Screen.



H126_9026AC

The Printer will automatically unlatch the Film Access Door.

[2] Open the door fully and pull the Receive Magazine Drawer all the way out.

Caution

Do not open the Receive Magazine until you are in total darkness.

When the Receive Magazine is removed, the software will change the "count" of the films in the Receive Magazine to zero.

Important

If the film is not removed from the Receive Magazine after removing the Magazine from the Printer, a film jam may occur when the Magazine becomes full. The Receive Magazine can hold 50 films.

[3] Take the Receive Magazine to the darkroom.

Caution

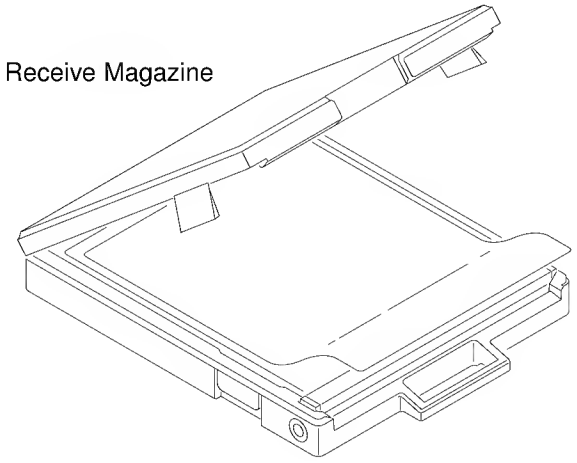
Unload the darkroom film in total darkness. No darkroom lights or safe lights can be used.

[4] Turn off all darkroom lights and safelights.

[5] Unlatch the two Side Latches to open the Magazine Lid.

Note

When the Receive Magazine is new, the Side Latches may be stiff and difficult to open.



H126_0012ACA
H126_0012AA

[6] Remove the film slowly, handling the films by the edges only. **Flip the film over so that it is emulsion side up.**

[7] Process the film with the **emulsion side up.**

[8] Turn on darkroom safelights and lights.

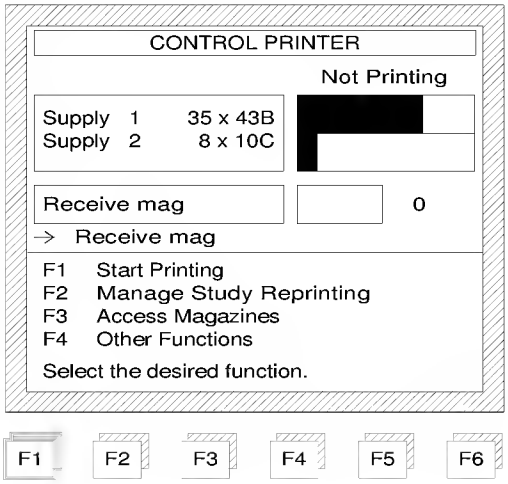
[9] Close the Magazine Lid and press in on the 2 Side Latches until they snap into place.

[10] Return the Receive Magazine to the Receive Magazine Drawer, push the Drawer all the way in, and close the Film Door.

[11] The operator has the option of pressing [F1] at the Control Panel to start printing or to access other features. These features include calibration or the transport of the film through the Printer to the docked *Kodak X-Omat* 180 LP or 180 LPS Processor. If none of the options is selected within a preset time delay, the Printer will automatically start printing.

Note

The time delay (1-60 seconds) is configured at installation.



H126_9124AC

Loading Film in the Darkroom

Caution

Be sure to load darkroom film in total darkness. No darkroom lights or safe lights can be used.

If changing the size of the film, the correct size Carrier Board must be used also. If necessary, order the correct Carrier Board from Eastman Kodak Company, Service Parts Management.

35 x 43 cm Carrier Board	Part No. 968300
35 x 35 cm Carrier Board	Part No. 968301
11 x 14 in. Carrier Board	Part No. 968302
8 x 10 in. Carrier Board	Part No. 968303

To load a film into an empty Supply Magazine:

[1] Make sure you have the proper film for the Magazine.

Note

Smaller films may not be loaded into Magazines that are configured for larger films.

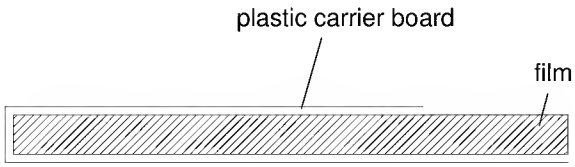
[2] Place the Magazine and the film package on a clean work table. Position the Supply Magazine so that the Handle is to your left.

[3] Open the Magazine Lid by lifting the Cover Release Latches on the two front corners of the Supply Magazine.

[4] Remove the Plastic Carrier Board from the Magazine and place it on the work table.

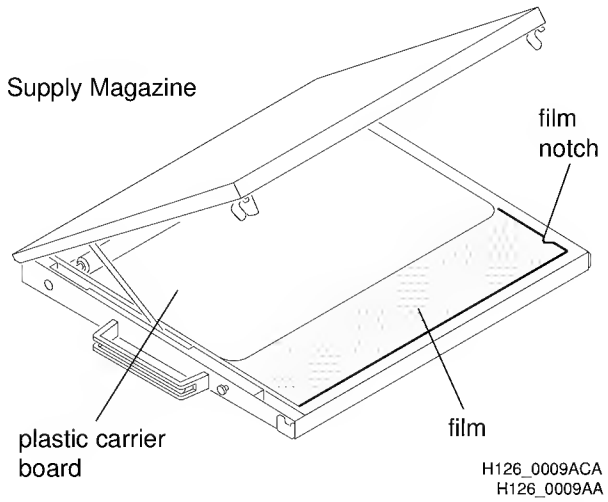
[5] Turn off the lights and safelights.

[6] Open the film package, and with the notch in the front right-hand corner (or the rear left-hand corner), put the stack of film inside the Plastic Carrier Board as illustrated in the side view below.



H126_3700ACA
H126_3700AC

[7] Put the combined film and Plastic Carrier Board into the Supply Magazine as illustrated below.



[8] Close the Magazine Lid by lifting the Release Button on the left-hand side of the Supply Magazine, lowering the Lid, and pressing on the Magazine Lid until it latches on both sides.

[9] Return any unused film to its light-tight container, and turn on the darkroom safelights.

Loading Film into a Partially-Empty Magazine

When loading film into a partially-empty Magazine:

[1] **Make sure to turn off all room lights before opening the Magazine Lid.**

[2] Place the new film under the old film to rotate the film in the Magazine.

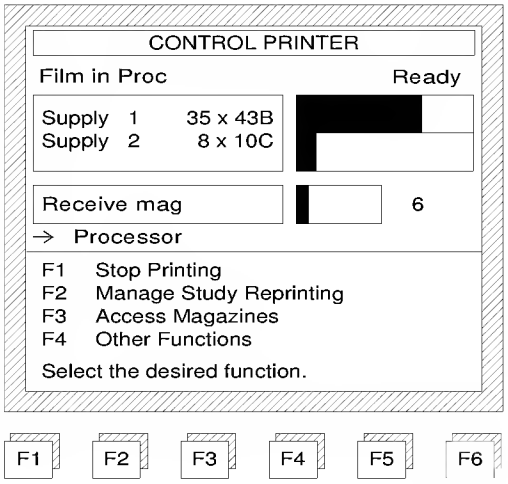
Using the Control Panel

The Control Panel on the front of the Printer contains a Display Screen, and six Control Panel function keys. The Control Panel function keys are labeled [F1] through [F6], and they correspond to *options* which appear in the Command Section of the Display Screen.

Control Printer Screen

The Control Printer Screen displays after the Printer completes its startup procedure.

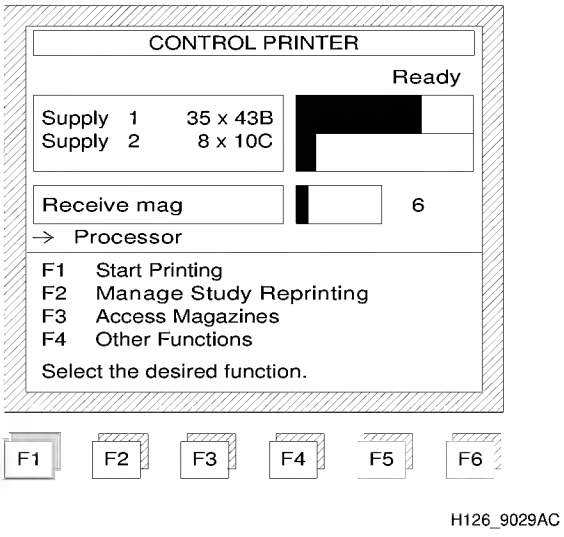
The following *screen* displays on the Display Screen most of the time during normal operation.



H126_9028AC

This *screen* shows the Processor as the selected destination. Also, the Receive Magazine could be selected as the destination.

Printing *images* is discussed in detail in Section 4, "Keypad Functions."



H126_9029AC

This function *toggles* between two alternatives:

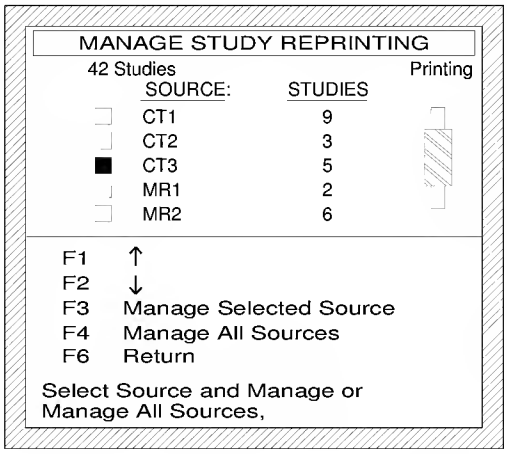
- "Start Printing"
- "Stop Printing"

When the "Start Printing" function is invoked, the Printer toggles the command and, if necessary, changes the *prompt* line to "Initializing mechanisms; please wait." Then, the Printer enables the other commands and changes the printer state to either "Printing" or "Ready."

When the "Stop Printing" function is invoked, the Printer *toggles* the command and changes the state to "Not printing."

Manage Study Reprinting

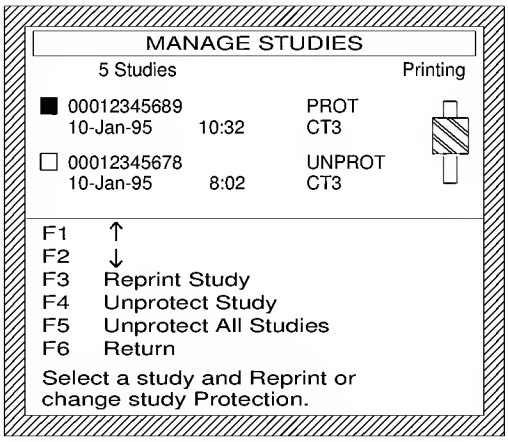
The Manage Study Reprinting Screen is discussed in Section 7, "Study Reprinting." It is accessed when you select [F2] on the Control Printer Screen.



H126_9110AC

Select [F1] or [F2] to see the sources that are not displayed and to select a source.

If you select [F3] or [F4] to print studies from one or all sources, the Manage Studies Screen appears.



H126_9111AC

The patient identification number, date and time of the study, source name, status (protected or unprotected), and scroll bar position within the list of studies are displayed.

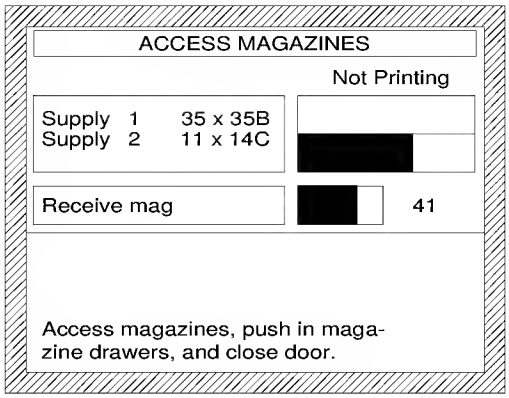
Access Magazines Screen

The Access Magazines function was discussed earlier, in the "Loading and Unloading Film" Section. It is accessed through the Control Printer Screen. Select [F3] to access this display.

This *screen* stops the printing of films and opens the Film Door so that you can fill the Supply Magazines or remove the Receive Magazine.

Note

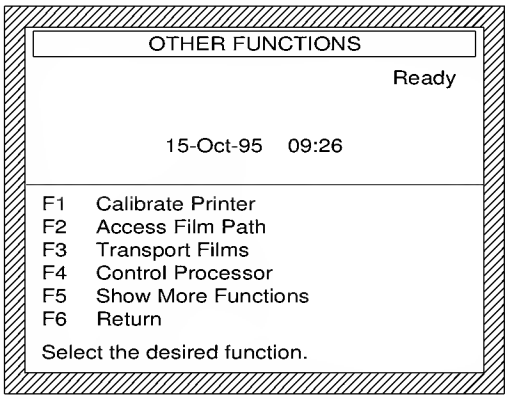
You may continue to store images and they will be held in the buffer.



H126_9031AC

Other Functions Screen

These *screens* allow you to perform other tasks.



H126_9032AC

Calibrate Printer

The [F1] function displays the Calibrate Printer Screen, which will be discussed in detail in Section 6, "Calibrating the 2180 Laser Printer."

Access Film Path

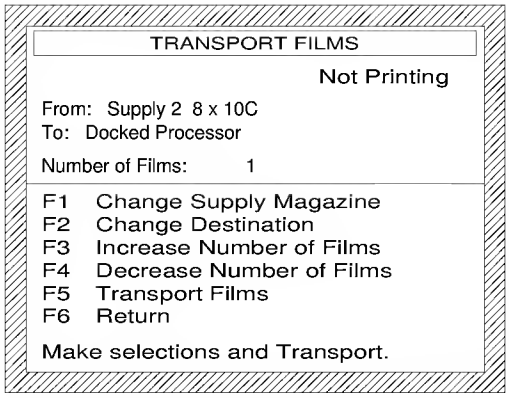
The [F2] function key should be pressed to open the Printer Door. The Printer stops printing and *prompts* you to turn the Printer Door Latch. You must open the Printer Door within 5 seconds of the *prompt*.

After you open the Printer Door, the Printer changes the *prompt* to "Access printer interior, push door closed, and turn latch."

To close the Printer Door, push it closed and turn the Latch clockwise to the vertical position.

Transport Films

The [F3] function displays the Transport Films Screen. The purpose of this function is to transport films from either Supply Magazine into the Receive Magazine or the docked Processor. This may be useful to clear fogged films from a Supply Magazine. These functions take place without exposing the film. The path of the film through the Printer and Processor is discussed in detail in Section 8.



H126_9033AC

Press [F1] to select the other Supply Magazine and change the Magazine and film type *fields*. If there is only one Supply Magazine in the Printer, this *option* does not appear.

Press [F2] to display the Select Destination Screen. This *option* does not appear if the Processor was not installed at system configuration time.

Press [F3] to increase the number of films in a range of 1 to 99 and "ALL." The key may be held down in autorepeat mode. "ALL" will transport all films from the selected Supply Magazine.

Press [F4] to decrease the number of films in a range of 1 to 99 and "ALL." The key may be held down in autorepeat mode.

Press [F5] to transport the films from the selected Supply Magazine to the selected destination.

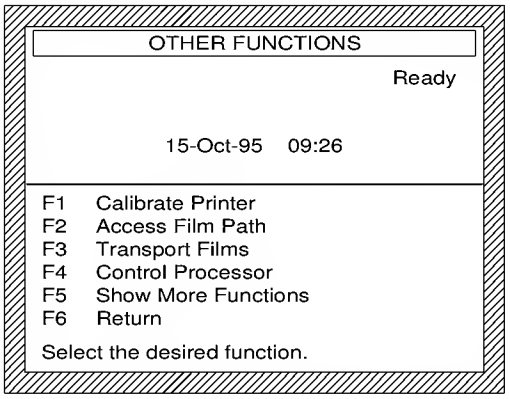
Press [F6] to return to the previous *screen*.

Control Processor

The [F4] function displays the Control Processor Screen if a Processor is installed with your Printer. The Control Processor Screen will be discussed in detail in the Processor section which is in Part II of this User's Manual.

Show More Functions

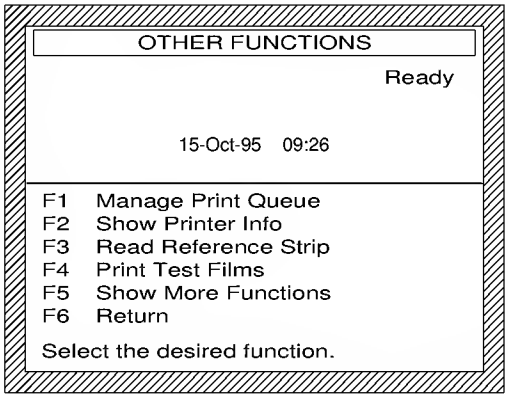
The [F5] function displays additional *options*, as shown in the *screen* illustration on page 3–31.



H126_9032AC

Return

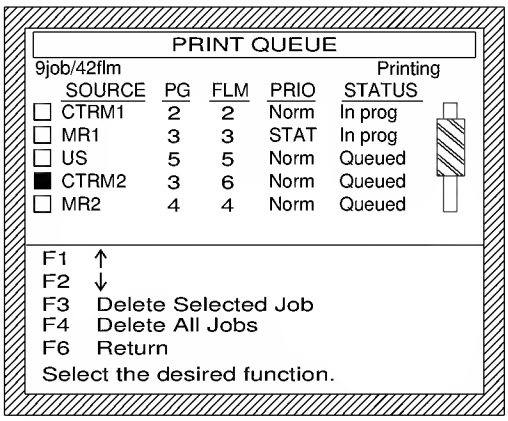
If you press [F6], you will be returned to the Control Printer Screen (the *screen* which you used to get to the Other Functions Screen).



H126_9034AC

Manage Print Queue

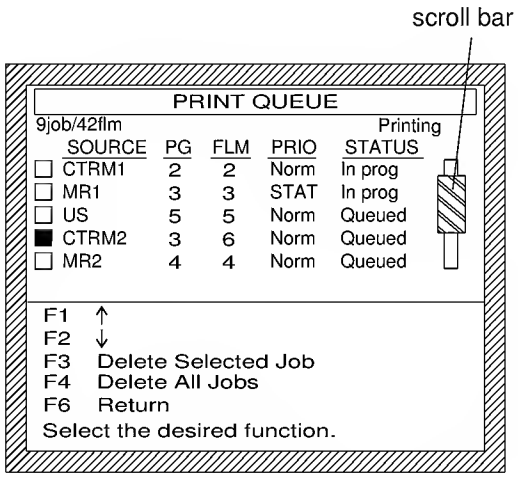
Press [F1] to display the Print Queue Screen. This *screen* will show all of the *jobs* in the print queue and allow you to delete *jobs*.



H126_9038AC

Print Queue Screen

You can check the status of a *job* or delete a *job* that is in the Printer's queue by looking at the Print Queue Screen.



H126_9038ACA
H126_9038AC

The total number of *jobs* and films in the print queue is shown in the top left-hand corner of the *screen*. This *screen* can only show a maximum of 5 *jobs* at a time. The *scroll bar*, located on the right-hand side of the display, shows the position of the displayed *jobs* relative to the rest of the print queue.

The Print Queue Screen displays the following information:

- **job** - Total number of print jobs.
- **flm** - Total number of films in the print queue. Each job is a copy of a study in the print queue.
- **Source** - a 5 character name for the *imaging device*. If a name is not assigned to a *imaging device*, the Printer will display "~~~~~". Also, the source can be "Test" for any test or transport films printed.
- **PG** - Number of pages in the *job*.
- **FLM** - Number of films remaining to be printed for the *job*.
- **Prio** - Priority - either "Norm," "STAT," or "Test." "Test" priority is for test or transport films only.

- **Job Status**, which may be one of the following:
  - "In prog." The *job* is in progress. Films in the *job* are moving through the Printer and Processor. Note that more than one *job* may have this status.
  - "Queued." The *job* is in the print queue ready to be printed.
  - If the job cannot print because the Printer Magazine does not have the required film type, the required film type displays, such as "35x43B".

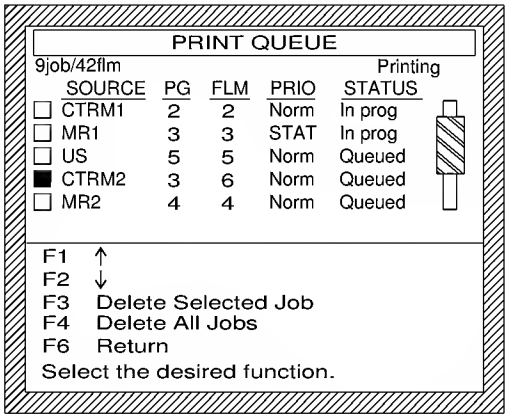
The queue display is updated as new *jobs* are added to the print queue and printed *jobs* are removed from it. If the print queue is empty, only the "Return" *option* displays.

Press [F1] to select the previous *job* (the *job* that immediately proceeds the *job* that is currently selected).

Press [F2] to select the next *job* (the *job* that immediately follows the *job* that is currently selected).

Deleting Jobs

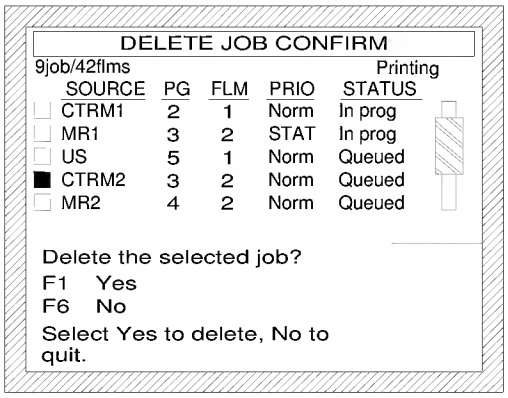
Before a *job* can be deleted, it must be selected by pressing [F1] or [F2] at the Print Queue Screen, as described in the previous section.



H126_9038AC

If you want to delete the *job* that is currently selected, press [F3]. The Printer displays the Delete Job Confirm Screen.

If you want to delete all *jobs* selected, press [F4]. The Printer displays the Delete Job Confirm Screen.


DELETE JOB CONFIRM
9job/42flms
Printing
SOURCE PG FLM PRIO STATUS
CTRM1 2 1 Norm In prog
MR1 3 2 STAT In prog
US 5 1 Norm Queued
CTRM2 3 2 Norm Queued
MR2 4 2 Norm Queued
Delete the selected job?
F1 Yes
F6 No
Select Yes to delete, No to quit.

H126_9039AC

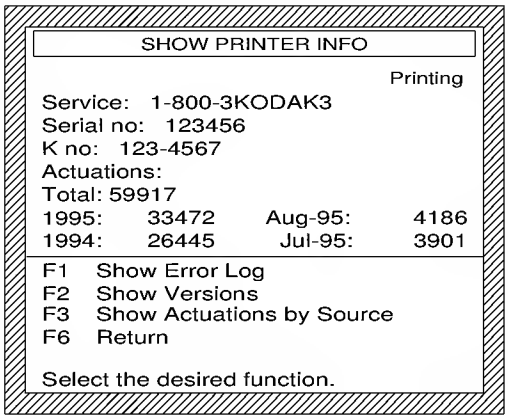
You will be asked to confirm that you really want the *job* deleted, or given a chance to back out without deleting the *job*.

Press [F1] to delete the selected *job* and return to the Print Queue Screen.

Press [F6] to return to the Print Queue Screen.

Show Printer Info

Press [F2] to display the Show Printer Info Screen. This *screen* shows the telephone number which you can call for service, the serial number, the "K" number, film counts, and the number of films that were printed this year and last year and this month and last month.



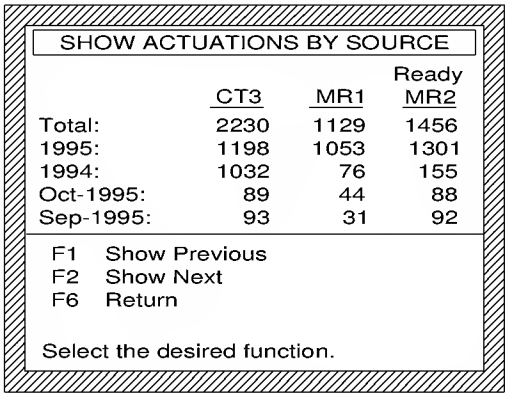
H126_9035AC

Press [F1] to display the Show Error Log Screen. This *screen* displays the error log in reverse chronological order. See the Error Recovery Screen for a description of the error message.

Press [F2] to display the Show Versions Screen. The versions of Printer software components display.

At the Show Versions Screen, press [F1] to display the Show Interfaces Screen. The Printer displays the status of the interfaces that have established communication with the Printer at the time this screen displays. For each interface, the Printer displays Node Id, Type, Version, and Source(s).

Press [F3] to display the Show Actuations by Source Screen. This screen provides the number of films that were printed from a directly connected imaging device during the specified time period. The Printer displays actuations by source in alphabetical order. This *screen* is not updated in real time. Therefore, as actuations occur, this screen will not be updated. If you exit and reenter this *screen*, the actuations count will be updated. A maximum of three sources can be displayed at one time. The source name is the same as that found in the Print Queue Screen.



H126_9093AC

At the Show Actuations by Source Screen, press [F1] to display the previous sources that have actuations. These sources are the imaging devices. The screen information will scroll to the left to show the previously displayed information.

At the Show Actuations by Source Screen, press [F2] to display the next sources. The screen information will scroll to the right to show the next information.

Note

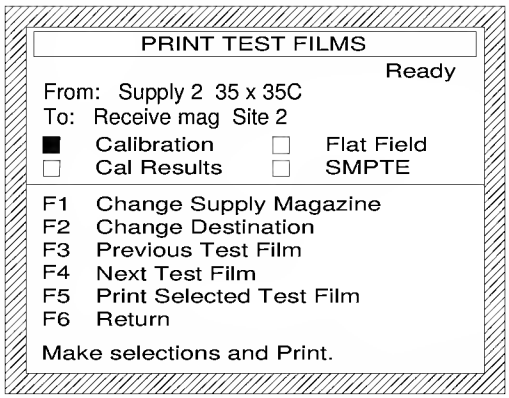
For the Show Previous and Show Next functions, the screen scrolls left to right and right to left to display the information, rather than up and down.

Read Reference Strip

The [F3] function of the Other Functions Screen will *prompt* you to slide the Reference Strip through the built-in *Densitometer* on the Film Door of the Printer. Maintenance of the *Densitometer* and use of the Reference Strip will be discussed in detail in the Preventive Maintenance section of Section 8.

Print Test Films

The [F4] function displays the Print Test Films Screen. This *screen* enables you to print test films to verify Printer and Processor operation.



H126_9036AC

Press [F1] to choose the Supply Magazine. The Supply Magazine selections are based on the available Magazines.

Press [F2] to change the destination of the test film. The screen will change to either the Receive Magazine or the docked Processor.

Press [F3] or [F4] to move forward or backward through to choices of Calibration, Cal Results, Flat Field, and SMPTE test films.

Press [F5] to print the selected test film.

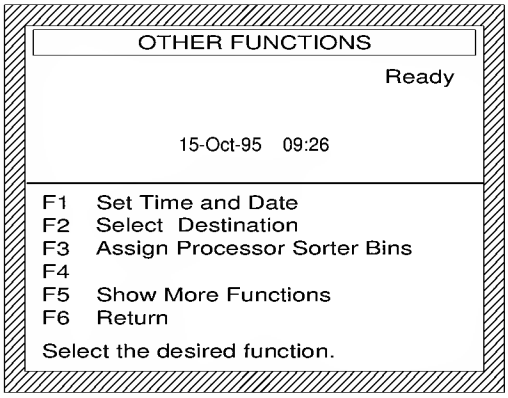
Press [F6] to return to the Other Functions Menu.

Return

If you press [F6], you will be returned to the previous *screen* (the *screen* which you used to get to the Other Functions Screen).

Show More Functions

The [F5] function displays the additional options in the Other Functions Screen.

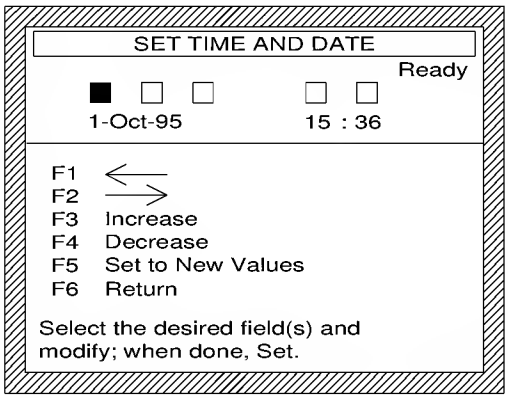


H126_9037AC

Set Time and Date

Select [F1] Set Time and Date from the Other Functions Screen to display the Set Time and Date function.

The [F1] function displays the Set Time and Date Screen.



H126_9094AC

Press [F1] and [F2] to move the black highlighted box to the day, month, or year, or the hour or minutes that you want to change.

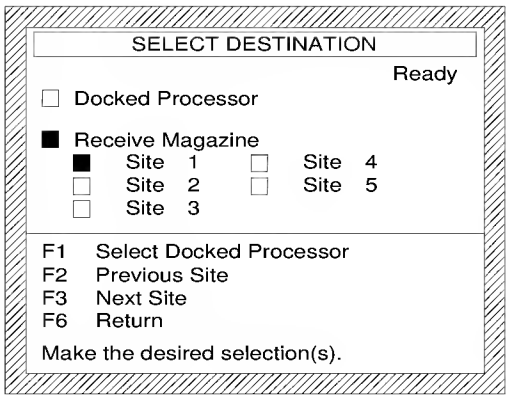
Press [F3] to increase and [F4] to decrease the date or time value.
Press [F5] to update the time or date to the new values.

Select Destination Screen

To select the destination for your exposed films, press the [F2] Control Panel function key while at the Other Functions Screen. The current destination is shown as selected on the *screen*.

A Printer can be *calibrated* to support up to five remote Processor sites. If the Receive Magazine is selected, you must select a Processor site so that the correct system *calibration* can be used.

You will use the Select Destination Screen when you set up your Printer and when changing from the docked Processor to the Receive Magazine to print or changing back to the Processor. This feature tells the Printer whether your exposed films should go to a docked Processor or a Receive Magazine. If you add a Processor to your Printer at a later date, you will use this *screen* to change the destination of films.



H126_9030AC

Press [F1] to select the docked Processor or Receive Magazine function. By pressing [F1], you highlight either the box to the left of "Docked Processor" or the box to the left of the "Receive Magazine".

When "Docked Processor" is selected, the Site information in the screen and the [F2] and [F3] commands are not shown. If no Processor is installed, the Processor line is not shown.

Press [F2] to select the site above the currently selected site. If you continue to press [F2], the sites are selected consecutively until the last site. At that point, the first site is selected, and the cycle continues.

Press [F3] to select the site below the currently selected site. If you continue to press [F3], the sites are selected consecutively until the last site. At that point, the first site is selected, and the cycle continues

Press [F6] to return to the previous *screen* (the *screen* which you used to get to the Select Destination Screen)

Assign Processor Sorter Bins

Press [F3] to select Assign Processor Sorter Bins. Refer to Section 17 "Sorter."

Show More Functions

The [F5] function displays the previous *screen* of Other Functions, as shown at the beginning of this section.

Return

If you press [F6], you will be returned to the main *screen*.

Section 4: Keypad Functions

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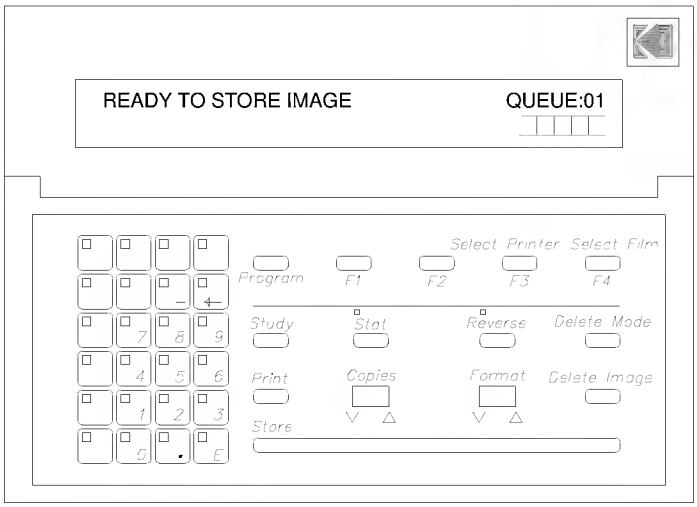
Using the Keypad

Take a few minutes to review the Keypad on the *Kodak Ektascan* 2180 Laser Printer.



H126_2713BC

Message Display

The display is divided into four areas.

Area	Function
Top line, left side	System status, for example, "Ready to Store Image"
Top line, right side	Number of *pages* remaining in the queue **for the associated *imaging device.*** (Other *imaging devices* will have their own queues that will be displayed on their keypads.)
Bottom line, left side	Displays information about such items as deleted *images.*
Bottom line, right side	Displays up to 5 boxes to indicate the Film Supply level of the selected film size for this Keypad. Each box represents 25 sheets of film.

Note

The maximum number of boxes displayed is 5. If there are more than 125 sheets of supply film, 5 boxes are displayed. (Since there are 2 Supply Magazines, the Printer can hold more than 200 sheets of one kind of film.)

Numeric Keypad

The left side of the Keypad functions both as Position Store Keys and as a numeric keypad. The numeric keypad is backlit only when the user is in the Program Mode. When the Keypad is used as a position store indicator, green indicates that the position is available for storage. Flashing green indicates that a position will be used next by the store function. A position flashes red as an *image* is stored. Solid red indicates a stored *image*.

Keypad, Right Side

Key	Function
Store Bar	Allows you to store an *image* into the next *default* position, (left to right, top to bottom).
Print Key	Allows you to send a *page* of *images* to the print queue. A format does not need to be filled for this key to work. As long as at least one *image* has been stored, the *page* can be sent to the queue. When operating in *Study* mode, the *page* is sent to the print queue but is not printed until the *study* is closed. This feature ensures that the *pages* of the *study* will be properly collated.
Copies	The Copies display and the [▲] or [▼] arrow keys below it are used to change the number of copies requested for a *page* or a *study* of *images*. Copies must be set before requesting a print.
Format	The Format display and the [▲] or [▼] arrow keys below it are used to scroll through the format *options* to change the format for a particular *page*. The format cannot be changed after storing an *image* without deleting or printing the *page*.
Reverse	Allows you to change the *image* polarity between normal and reverse ("blackbone"). This feature can be changed *image* by *image*.
Stat	Allows you to move a *page* ahead of all non-STAT *pages* in the queue. It ensures that the *page* will print before non-STAT print requests. If you're in *Study* Mode, this will apply to *studies* instead of *pages*.
Delete Image	Used to erase an *image*. After it is pressed, the system will *prompt* you to indicate which *image* you want to erase. The delete function is described in more detail later in this section.
Delete Mode	Allows you to indicate whether a *page* or *study* is to be deleted.

Key	Function
Program	Allows you to access window *options*, print *options*, and configuration *options*. For further information on these *options*, see the "Program Options" section.
Study	Groups several *pages* of *images* together. Pressing [Study] signals the end of a *study*. A *study* allows you to print *pages* 1, 2, 3,... from *imaging device* A, then *pages* 1, 2, 3,... from *imaging device* B so that the *pages* are printed in order and not intermixed. The *study* feature can be turned on or off.
Function Keys: [F1] through [F4]	Used primarily in Program mode. The system will *prompt* you for necessary input.
Select printer	This feature is available for Printers interconnected through the network. For information regarding the operation of interconnected Laser Printers, please refer to the User's Guide for the *Kodak Ektascan* Network Interface for Laser Printer Interconnect. On networked systems, if a remote Printer is the selected Printer, the name of the Printer will replace Queue and Film Supply level information on the display of the Keypad.
Select Film	Allows you to scroll through the available film sizes and types, and specify which film you want to use to print *images*.

Footswitch

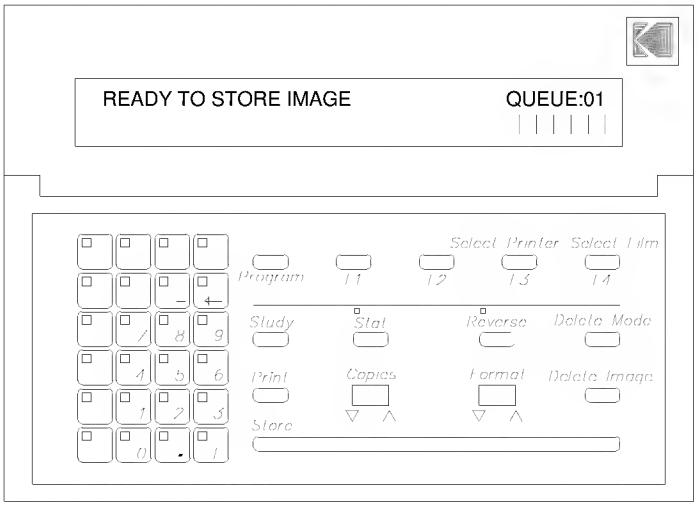
The Footswitch connects directly to the Keypad. Pressing the Footswitch stores an *image* just like the [Store] bar on the Keypad stores an *image*,
(left to right, top to bottom).

Storing Images and Printing Pages

Position Store Keys

This section describes storing *images* and printing *pages* using a Keypad. If *autofilming* is used or these functions are controlled by the *imaging device*, check the appropriate *imaging device* manual for the correct procedures.

Most formats activate the Position Store keys on the Keypad.



H126_2713BC

Storing Images

[1] Before storing *images*, check that the desired "Format" and "Program" *options* are selected.

[2] To store an *image*, press a Position Store key or the [Store] bar.

Note

- The *default* sequence for storing *images* is from left to right, top to bottom.
- If the Position Store keys are not illuminated for the selected format, use the [Store] bar to store *images*.
- A Supply Magazine or Receive Magazine does not have to be present to store an *image*.
- You can continue storing or "printing" *images* even when the Printer is out of film or in an error condition.

Setting Formats

The procedures for changing *options* are listed below. The *options* are changed through the Keypad.

The *Kodak Ektascan* 2180 Laser Printer retains the most recently-used format for the next *page*.

Sixteen standard formats are available. They are formats 1, 2, 4, 6, 8, 9, 12, 15, 16, 20, 24, 30, 35, and Kodak formats F1, F2, and F3.

The formats that are available depend upon the amount of *image* memory that is installed in the Laser Printer, the input *image* size, the film size, and common text.

[1] To change formats, locate the [Format] display on the Keypad.

[2] Press the [▲] or [▼] arrow keys below the [Format] display until the desired format number is displayed. The Position Store keys at the left of the Keypad will light to show the store positions of the format selected.

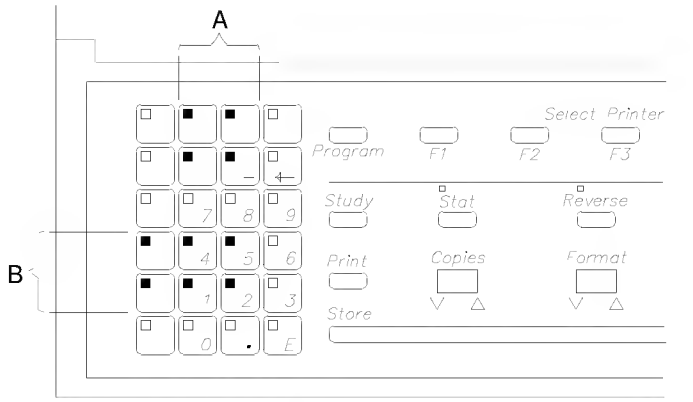
Formats with more than 4 columns or 6 rows will not be displayed. Formats may only be changed when no *images* have been stored on a *page*.

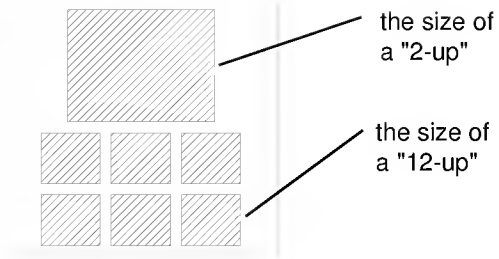
Special Format F1

Special Format F1 allows the printing of one large *image* and six smaller *images*.

Locate group "A" in the figure below. These four keys represent **one** *image* store position. Any of the keys in this group may be selected to store (or delete) the *image* for this position. Solid red LEDs illuminate in all four positions when the position is filled.

Locate group "B" in the figure below. These six keys represent six **separate** *image* store positions. Each key is used to store or delete an *image* in its assigned position. A solid red LED illuminates the position chosen.





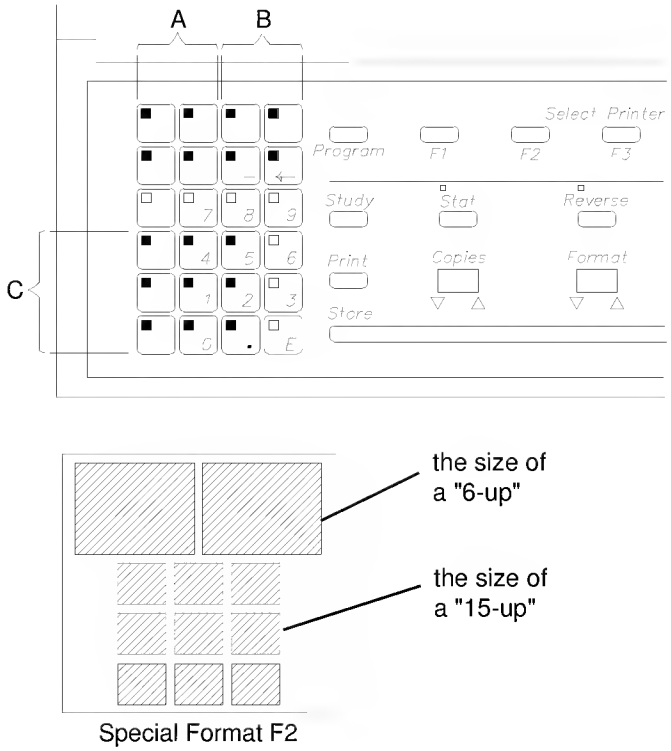
Special Format F1

Special Format F2

Special Format F2 allows the printing of two large *images* and nine smaller *images*.

Locate group "A" and "B" in the figure below. These eight keys represent **two** *image* store positions. Any of the keys within a group may be selected to store (or delete) the *image* for these positions. Solid red LEDs illuminate in all four positions when the position is filled.

Locate group "C" in the figure below. These nine keys represent nine **separate** *image* store positions. Each key is used to store or delete an *image* in its assigned position. A solid red LED illuminates the position chosen.



Special Format F2

H126_2716HC

Special Format F3 - Slides

The F3 Special Format *option* provides 35 mm landscape slides in a 12-up format (4 rows of 3 columns).

Important

Printed slides may not include all of the original *image* data. Do not use slides for primary diagnosis. The Laser Printer must be configured with enough memory to allow a format of 12 *images* on 1 film (page) for slides to be generated.

Reverse Setting

This *option* allows you to select normal or reverse ("blackbone") tone scale for each *image*. The *default* tone scale is normal.

Note

When the tone scale is reversed, the REVERSE indicator light is lit on the Keypad.

To change the tone scale from its current state, press Reverse] on the Keypad.

Number of Copies

The maximum number of copies that you can select is 99. If operating in Page Mode, the number of copies must be changed prior to printing. If operating in *Study* Mode, the number of copies must be changed prior to closing the *study*. The number of copies selected will *default* to the value that was last entered.

To change the number of copies, press the [▲] or [▼] arrow keys below the [Copies] display.

Printing Pages

To print a partial or complete *page* of *images*, press [Print] on the Keypad.

Note

You can continue storing or "printing" *images* even when the Printer is out of film or in an error condition.

Autoprint Printing

When the *Autoprint* function is *enabled*, the Printer will automatically send the Print request when all *image* positions have been stored on the selected format. To enable the *Autoprint* function, see the procedure in the "Program Options" section.

STAT Printing

The [Stat] key allows you to move a *page* or *study* ahead of all non-STAT *pages* in the print queue. Any STAT job, whether it be a *page* or a *study*, moves ahead of any normal job but behind an earlier STAT job in the print queue.

To print a STAT *page*:

[1] Press [Stat] **before** issuing the "Print" command, or, if *Autoprint* is *enabled*, before storing the last *image* on the *page*. When you press [Stat], the green indicator light is illuminated.

Note

To cancel the STAT request before sending the *page* to print, press [Stat] again. When you press [Stat] again, the green indicator light is not illuminated. STAT is automatically disabled when the *page* is transferred to the print queue or a STAT *page* is deleted.

[2] To request another STAT *page*, press [Stat] again.

Deleting Images or Pages

Deleting Images

If you are using a format for which the Position Store keys are active, press [Delete Image] once, and then press the specific Position Store key of the *image* to be erased.

If the format selected does not illuminate the position store keys, you can delete *images* by pressing [Delete Image] twice. This will delete the last *image* that was stored. This method of deleting an *image* is available when the position store keys are illuminated.

Deleting Pages

If operating in Page Mode, press [Delete Mode], and then select "Delete Page" to delete a partial or complete *page*.

Note

A *page* must be deleted **before** it has been placed in the print queue.

Deleting Studies

When in *Study* Mode, press [Delete Mode], and then:

- Press [F1] to delete the *page* that is currently open, or press [F2] to delete the entire *study*.
- Press any other key to cancel the Delete request.

Note

A *study* must be deleted **before** it has been placed in the print queue by ending the *study*.

Program Options

Overview

Important

Entering this mode could result in unintentionally changing *image* parameters and system set-up.

The [Program] key on the Keypad allows access to the functions which do not have dedicated keys on the Keypad. Included in the functions of this key are the following items:

- Window *Options*
- Print *Options*
- Reprint *Options*
- Configuration

There are sub-options under the above headings. Such *options* include *Curve Shape, Interpolation, Contrast, Autoprint, Audio,* and *Rotation*. Definitions of these terms can be found in the Glossary.

Tone Scaling

Tone scaling is a technique of making the printed *images* match the *images* on the input monitor.

Caution

Tone scale adjustments should only be done by trained personnel.

Important

Before doing a *tone scale* adjustment, verify that the monitor for the *imaging device* has been properly adjusted. This monitor adjustment should not be changed once the *tone scaling* has been completed.

To adjust the *tone scale*, use the following procedure:

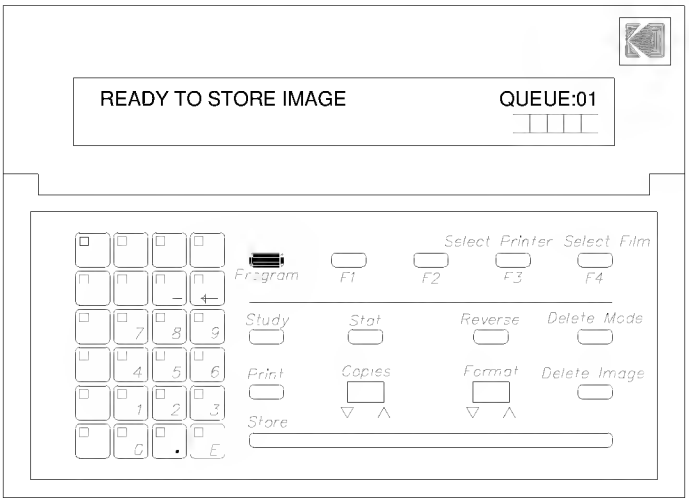
[1] *Calibrate* the Laser Printer.

[2] For each remote Keypad to a Laser Printer;

- Adjust the minimum to maximum *density* (*Image Dmin*, *Image Dmax*, and *Border Dmax*).
  Use the Keypad [Program] key to enter the values.
- Adjust the *curve shape*.
  Use the Keypad [Program] key to enter the values.
- Adjust the *contrast*.
  Use the Keypad [Program] key to enter the values.

Entering and Leaving the Program Function

To enter the Program Function, press [Program].



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The Program Menu will be displayed, and the numeric keypad will be active at this time.

```
F1 WINDOW OPTIONS          F2 PRINT OPTIONS
F3 REPRINT OPTIONS         F4 CONFIGURATION
```

To exit the Program Function, press [Program]. If a parameter has been changed and is valid, it is saved.

Note

F3 REPRINT OPTIONS is discussed in Section 7, "Study Reprinting".

Window Options

The Window Options Menu is the F1 selection of the Program Menu. It allows the user to change the window width, level, *curve shape*, or to print a curve series.

```
F1 WINDOW WIDTH            F2 WINDOW LEVEL
F3 CURVE SHAPE             F4 CURVE SERIES
```

Important

The window *options* are normally set at the time of installation. At that time, they are adjusted so that the Laser Printer film output matches the console monitor. Unless the films no longer match the monitor, **do not change them**.

Window Width

To change the window width, press:

[Program]

[F1]

[F1]

The system will ask you to enter a window width value.

Note

The valid window width value range is between 1 and 4096.

- The *default* value is 256.
- Change the window width to 4096 when connecting to a 12-bit digital output workstation or *imaging device*.

Note

```
WINDOW WIDTH ENTRY
WIDTH:  256
```

Enter a value on the numeric section of the Keypad and, to remain in the Program Mode, press [E] on the numeric keypad. To specify the value and exit from the Program Mode, press [Program].

Window Level

To change the window level, press:

[Program]

[F1]

[F2]

The system will ask you to enter a window level value.

Note

The valid window level value range is between 0 and 4095.

- The *default* value is 128.
- Change the window level to 2048 when connecting to a 12-bit digital output workstation or *imaging device*.

```
WINDOW LEVEL ENTRY
WIDTH:  128
```

Enter the value and, to remain in the Program Mode, press [E] on the numeric keypad. To specify the value and exit from the Program Mode, press [Program].

Curve Shape

To change the *curve shape*, press:

[Program]

[F1]

[F3]

The system will ask you to enter a *curve shape* value.

Note

The valid *curve shape* value range is between 0 and 6. The *default* value is 3. In some cases, the *curve shape* may be changed if *images* have already been stored on a *page*. In other cases, the *curve shape* may be changed only when the *page* is empty. It depends on how the Printer was configured for your site.

```
CURVE SHAPE ENTRY
SHAPE:  3
```

Enter the value and, to remain in the Program Mode, press [E] on the numeric keypad. To specify the value and exit from the Program Mode, press [Program].

Curve Series

The allows the user to select one *image*, print 6 curve shapes on one sheet of film, and then determine which *image* represents the desired optimal *image* appearance. Then, the number of the selected curve shape would be entered into the system by using the "Curve Shape" submenu *option*. This *option* is found within the [Program] option.

To use the "Curve Series" option:

[1] Display a desired *image* on the monitor and do not change the *image* during this procedure.

[2] Press:

[Program]

[F1]

[F4]

[3] Wait for the Laser Printer to do the following:

(a) store the *image* 6 times (using 6 curve shapes)

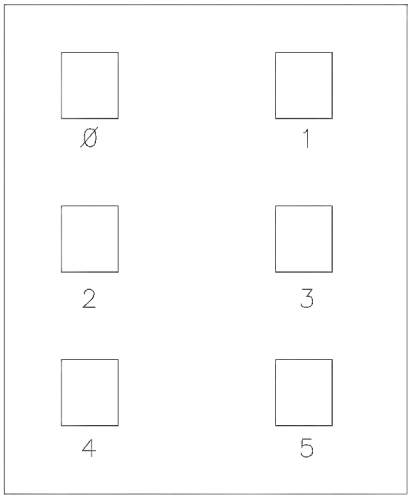
(b) send the page to print.

[4] Process that *page* of *images*.

[5] Use the illustrations on the next page to select the curve shape number of the *image* with optimal *image* appearance.

[6] Enter that curve shape number into the system by using the *curve shape* submenu for the [Program] key.

Figure 4–1 **Curve Shapes 0 through 5 on 35 x 43 cm, 35 x 35 cm, and 11 x 14 in. film**



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Print Options

Overview

Before you can enter the Print Options Menu, there can be no *images* stored on the current *page*.

To enter the Print Options Menu, press:

[Program]

[F2]

The system will display the following *menu*.

```
F1 INTERPOLATION          F2 BORDER OPTION
F3 TRIM OPTION            F4 CONTRAST OPTION
```

Interpolation Type

Replication, Bilinear, Cubic Spline 1 (normal) and *Cubic Convolution 2* (edge enhancing) are used to enlarge *images* to their maximum size, based on the selected format. The *No Magnification option* prints *images* without enlarging them. The *default* is *Cubic Spline 1*.

To change the *interpolation* type, press:

[Program]

[F2]

[F1]

The current *interpolation* type will be displayed and the system will *prompt* you to press [F1] to display the next *interpolation* type.

When the desired *interpolation* type is displayed, press [E] on the numeric keypad to remain in the Program Mode or press [Program] to specify the type and exit.

Border Option

The Border Option allows the user to select black or clear borders for the non-*image* area. See also the Trim Option. The factory *default* for the Border Option is black.

To change the border type, press:

[Program]

[F2]

[F2]

The current Border state will be displayed as BLACK or CLEAR.

To change the Border, press[F1] followed by [E] on the numeric keypad or [Program].

Trim Option

The Trim Option allows a 2 pixel wide frame around each *image*.

To change the trim option from its current state, press:

[Program]

[F2]

[F2]

The current state will be displayed as TRIM ON or TRIM OFF. To change it, press [F1] followed by [E] on the numeric keypad or [Program].

Contrast Option

To enter the Contrast Option Menu, press:

[Program]

[F2]

[F4]

The system will display the following *menu*:

```
F1 CONTRAST                F2 IMAGE DMIN
F3 IMAGE DMAX              F4 BORDER DMAX
```

Image Dmin, Image Dmax, and Border Dmax

The Printer can set the *Image Dmin* and *Image Dmax* for all of the *images* on a *page*. The *Image Dmax* must be less than or equal to the *Border Dmax*. The lowest printable *Image Dmin* is the *calibration* test *page Dmin*. The *Dmin* can be set to zero. When a *page* has a clear border, the trim is dark. When there is a black border, the trim is white.

You should understand the relationship between *image density restriction* and contrast adjustment. If you reduce both *Image Dmax* (restrict) and contrast (negative contrast), the *density* will be reduced more than you might expect.

The 2180 Laser Printer allows each *imaging device* to select *Image Dmin, Image Dmax*, and *Border Dmax* individually. For example, an ultrasound user might select an *Image Dmin* of 0.0, an *Image Dmax* of 2.5, and a *Border Dmax* of 2.8, while a CT user might choose an *Image Dmin* of 0.0, an *Image Dmax* of 3.0, and a *Border Dmax* of 3.0. *Border Dmax* allows you to select the highest printable *density*.

Contrast

To change the contrast setting, press

[Program]

[F2]

[F4]

[F1]

The system will *prompt* you to enter the contrast value.

```
CONTRAST ENTRY
CONTRAST:  0
```

Note

The valid range of contrast values is -5 to +5. The + means higher contrast and the - means lower contrast. The *default* value is 0. When entering a negative value, press the minus sign first.

Enter the value and, to remain in the Program Mode, press [E] on the numeric keypad. To specify the value and exit from the Program Mode, press [Program].

To enter the Reprint Options Menu, press

[Program]

[F3]

Note

See Section 7, “Study Reprinting”.

Configuration

To enter the Configuration Options Menu, there can be no *images* stored on the current *page*. The Configuration Options Menu allows you to access and change the following:

- *Autoprint*
- *Audio Option*
- *Rotation Option*
- *Study Option*

To enter the Configuration Options Menu, press:

[Program]

[F4]

The system will display the following *menu*.

```
F1 AUTOPRINT              F2 AUDIO OPTION
F3 STUDY OPTION           F4 ROTATION OPTION
```

Autoprint

The *autoprint option* allows you to specify that a *page* should be sent to the print queue automatically when the *page* format has been filled with *images*. When *autoprint* is not *enabled*, press [Print] on the Keypad to send each *page* to the print queue. The *default* setting for *autoprint* is ON.

To change the *autoprint* status, press:

[Program]

[F4]

[F1]

The current setting will be displayed.

To change the *autoprint* setting, press:

[F1]
[E]

Note

The [Print] key can be used at any time, even if *autoprint* is ON. This means that you can print partial *pages*, even if the *page* is not filled.

Audio Option

The *Audio menu* selection allows you to specify a preference for audible feedback from the keypad.

The *options* include:

- no audible feedback
- the "Store" tone sounds when you begin a Store command
- the "Store" tone sounds when a Store command is completed
- the "Store" tone sounds at both the beginning and the end of the Store command

The *default* setting is for the "Store" tone to sound at the beginning of a Store command.

To change the *audio* status, press:

[Program]

[F4]

[F2]

The current setting will be displayed.

To change the current setting, follow the system *prompts* and press [E] on the numeric keypad.

Study Option

The *Study* Option allows you to work in either *Page* Mode or *Study* Mode. *Study* Mode groups several *pages* of *images* together. Pressing[Study] signals the end of a *study*. A *study* allows you to print *pages* 1, 2, 3,... from *imaging device* A, then *pages* 1, 2, 3,... from *imaging device* B so that the *pages* are printed in order and are not intermixed. The *study* feature can be turned on or off.

Note

When operating in *Study* mode, you must select the number of copies before you close the *study*.

Rotation Option

This *option* allows you to have all *images* of a format rotate 90° clockwise. A *rotation* type (ON or OFF) is saved for each format. The *default* setting for each format is OFF.

Note

- The time required to store an *image* will increase when the *rotation option* is ON.
- The *common text* will not rotate. In other words, the *common text* will appear in the same position on the film with *images rotation* ON or OFF. See the example on the opposite page. *Common text* is defined on page 5–12.
- If the *rotation option* is not valid for a specific format because of the *image* size, the system will not allow that format to have *rotation* ON. The keypad will beep when you try to select *rotation* ON, indicating that you have pressed an invalid key.

To change the *rotation* status, press the [Format] [▲] or [▼] arrow keys until the desired format is displayed.

To display the current *rotation* setting, press:

[Program]

[F4]

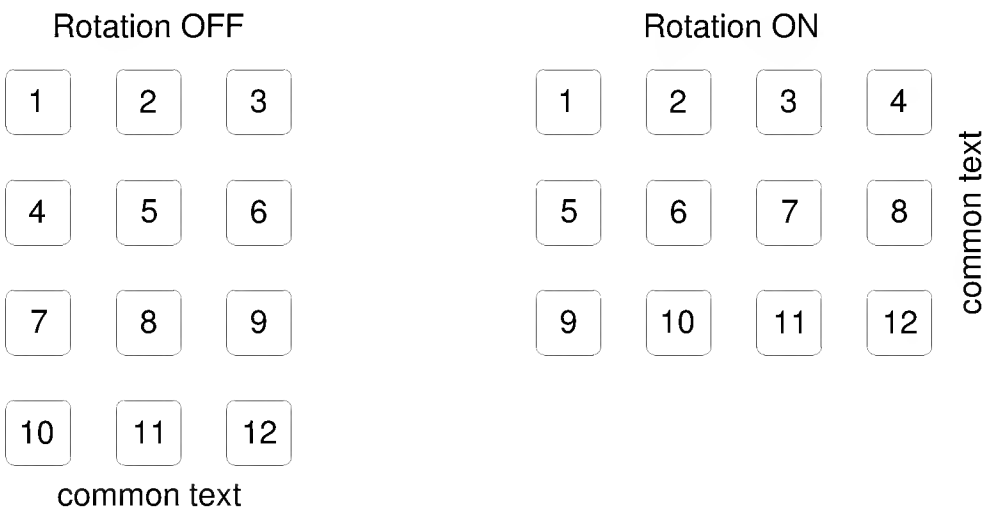
[F4]

To change the current setting, press [F1]. The setting will *toggle* between OFF and ON.

To store the new setting, press [E] on the numeric keypad. To store the new setting and exit from the Program Mode, press [Program].

The following is an example of a 12-up format. The diagram at the left indicates the arrangement of the *image*s on the film with *rotation* OFF. The diagram at the right indicates the arrangement with *rotation* ON. Note that the position of the *common text* on the film is the same in both cases.

The illumination pattern of the LEDs on the keypad is the same as the arrangement of the *image*s on the film. However, if the format and *rotation* options you select cannot be represented by the 4 x 6 LED matrix on the keypad (for example, a 24-up format with *rotation* ON), the LEDs and their associated store keys are disabled. This means that the LEDs do not illuminate when you press the keys. In this case, the *image*s can be stored only in their *default* positions by pressing the Store bar. The keypad displays a status message as each *image* is stored.


Rotation OFF
1
2
3
4
5
6
7
8
9
10
11
12
common text
Rotation ON
1
2
3
4
5
6
7
8
9
10
11
12
common text

Auxiliary Keypad

Introduction

The Auxiliary Keypad is a standard keypad that is used with an autofilming link. The Auxiliary Keypad is available to some autofilming *imaging devices*. With certain *imaging devices*, the keypad functions in Display Mode only. In others, the user may switch from Display Mode to Active Keypad Mode.

Note

Consult your Kodak representative for the modes available with your *imaging device*.

Display Mode

When the auxiliary keypad is attached in addition to the autofilming link, and the Laser Printer and *imaging device* are powered on, the following screen could appear on the keypad display.

```
DISPLAY MODE                QUEUE:00
F2 TO SWITCH CONTROL
```

If the [F2] key is not pressed, the autofilming link controls the Laser Printer. The Keypad acts only as a display.

The Keypad will display

- printer messages
- error messages (for the Interface)
- queue status
- film supply quantity
- the *image* store positions
  The *image* store positions (map) will show the current *page* layout or where the *images* have been stored within this layout. The map will indicate stored *images* in red and layout in green.
- the LED window below the COPIES
  This LED will indicate the number of multiple originals to be printed.
- the LED window below the FORMAT
  This LED indicates the present format number.

Note

When changes are made at the *imaging device*, the Keypad is updated when the *imaging device* sends the information to the Printer.

Active Keypad Mode

By pressing [F2] to make the Keypad active, the following screen displays.

```
READY TO STORE IMAGE      QUEUE:00
F2 TO SWITCH CONTROL
```

The keypad features are:

- Store
  availability depends on the *imaging device*
- Print
  availability depends on the *imaging device*
- Delete Mode
  availability depends on the *imaging device*
- Delete Image
  availability depends on the *imaging device*
- Study
  Not Available
- Stat
- Reverse
- Copies
- Format
  availability depends on the *imaging device*
- Program
- Select Printer (F3)
- Select Film (F4)
- Footswitch support

Note

If a particular feature is not available, the unit will sound a tone when you try to access the feature.

Note

Pressing [F2] again will return you to the Display Mode screen.

Section 5: Control Terminal

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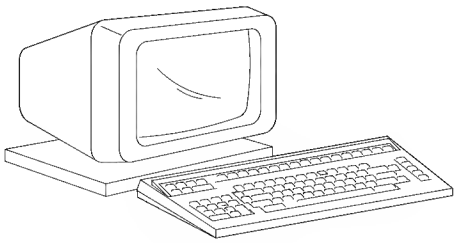
Overview

The *Control Terminal* can be used to supplement *autofilming* or Keypad features for any device that sends commands to the Laser Printer. These features include *Dmin* and *Dmax* settings, *contrast adjustment*, and common text.

Note

Occasionally, an *autofilming* device will override a desired function that has been set up with the *Control Terminal*. If this happens, contact your Service Representative regarding the operation of the *imaging device* with the Laser Printer.



Control Terminal

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H126_0021AA

The Main Menu

Overview

The Control Terminal Main Menu allows access to four groups of *options*:

- **Operational Mode**
  - Enter Format
  - Enter Number of Copies
  - Set Print Priority
  - Set Rotation
  - Enter Interpolation Type
  - Select Film (size and base)
  - Set Polarity
  - Set Page Functions
  - Return
- **Image Setup**
  - Enter Widow Width
  - Enter Window Level
  - Set Border Density
  - Set Trim
  - Enter Contrast
  - Enter Image Dmin
  - Enter Image Dmax
  - Enter Border Dmax
  - Change Key
  - Curve Shape
  - Curve Series
  - Return
- **Common Text Setup**
  - Update Text
  - Delete Text
  - Return

- **Change Destination**

  Used for redirecting inputs (sources) to alternative *Kodak Ektascan* Laser Printers on a network. For details of this operation, refer to the User's Guide for the *Kodak Ektascan* Network Interface for Laser Printer Interconnect.

Caution

Never press [Set Up] at the top right of the *Control Terminal* keyboard. This key is used to reconfigure the Terminal. Pressing it will invalidate the customized installation *default* settings for the *Control Terminal.*

If [Set Up] is accidentally pressed and a *menu* is displayed, press [Set Up] again to exit from that *menu.*

Reaching the Main Menu

Follow these steps to reach the Main Menu:

[1] Verify that the *Control Terminal* is turned on. The ON/OFF switch is on the right side of the Terminal, with the Brightness and *Contrast adjustments*.

[2] If the Display Screen is blank, press any key to display the Main Menu. If the Main Menu does not appear, see the Troubleshooting section for the Control Terminal.

Important

Select *menu* item 1 below only if the terminal type is WYSE. If the Terminal is not a WYSE terminal and item 1 is accidentally selected, the Mode Selection Menu will be displayed. At that menu, press [Esc] to return to the Terminal Type Menu and select item 2.

If the user indicates a WYSE terminal specification when it is not a WYSE terminal, and makes a selection from the Mode Selection Menu, with the non-WYSE terminal, the *Control Terminal* display may show a garbled message.

If the user presses [Esc] and the system returns to the Mode Selection Menu, nothing further needs to be done. If the Terminal does not respond to the [Esc] key, the terminal parameters may have been changed by the error. Reset the parameters to their original values, and press [Esc]. At the Terminal Selection Menu, select the correct specification.

[3] Specify that the Terminal is a WYSE terminal or a different type.

```
              TERMINAL TYPE MENU

  1.  Kodak Control Terminal (WYSE)
  2.  Kodak Service Engineering Terminal

  Enter Menu Item:1
```

[4] Specify that the Terminal is to be used for Laser Printer operations rather than service operations.

```
             MODE SELECTION MENU

  1.  Laser Printer Operations
  2.  Service Operations

  Enter Menu Item:1
```

[5] Select which *imaging device* is to be affected by the *Control Terminal* operation.

```
         INPUT SELECTION MENU

  1.  First imaging device
  2.  Second imaging device
      .
      .
      .
  Enter Menu Item:1
```

Note

The *imaging device* names shown on the Input Selection Menu are user-specified.

Procedure

To reach the Main Menu from the initial Terminal Type Menu, enter:

1. [1] and press [Enter].
2. [1] and press [Enter].
3. [n] (the *menu* number of the *imaging device*) and press [Enter].

The Main Menu and the name of the *imaging device* affected will be displayed. The name of the *imaging device* affected will be printed on the *screen* when each of the Main Menu suboptions are displayed.

```
              MAIN MENU

  1.  Operational Mode
  2.  Image Setup
  3.  Custom Format
  4.  Common Text Setup
  5.  Change Control Link
  6.  Change Destination
  7.  Return to Input Menu

  Enter Selection: 1
```

Note

At start up, the Main Menu has 7 options as listed. After the system is configured, item number 5 “Change Control Link” is dropped and 6 options remain.

When an *option* from the Main Menu is selected, press [Enter]. The next *screen* shows both the submenu *options* and, at the bottom of the *screen*, a list of the Function keys [F1] through [F10] and what they do. Where more *options* exist than can be shown on one list, the [F9] key will be designated as the [Change] key. Pressing [F9] will cause the remaining available *options* to be displayed.

Operational Mode

The following functions are available through the Operational Mode Menu. The values for **most** of these functions will be displayed on the *screen* in an area that is labeled "Current Settings."

- F1 Change Format
- F2 Number of Copies
- F3 Print Priority
- F4 Rotation
- F5 Interpolation Type
- F6 Select Film
- F7 Polarity
- F9 Page Function:
    - F1 Store Defined
    - F2 Store Position
    - F3 Print Page
    - F4 Delete Defined
    - F5 Delete Position
    - F6 Delete Page
    - F9 Param. Func.
    - F10 Return

Change Format

All valid formats will be displayed when this function is selected.

To enter an [F1] through [F3] format, type the letter "F" and the number. For example, press "F" and "1". The [F1], [F2], and [F3] function keys above the normal keyboard area are not available whenever a *prompt* is active, so the two items must be typed.

When a format has been specified, the *page* diagram will be updated to reflect the new format.

Number of Copies

Enter the number of copies (1-99).

Print Priority

This function allows the user to either:

- specify that *pages* or *studies* be printed as "STAT", and move ahead of other non-STAT *pages* or *studies* in the printer queue.
- remove the "STAT" condition.

The STAT key toggles the current setting "ON" or "OFF."

Rotation

All images to be rotated 90° when printed on film.

Interpolation Type

The "Current Settings" area of the *menu screen* will be replaced with the available *interpolation options*. Select one of the *options* to set the *interpolation* type.

Select Film

Allows the selection of the appropriate film size and base tint supported by the Laser Printer.

Polarity

Normal or Reverse.

Store Position

The *default image* store positions are from left to right and from top to bottom.

The "STORE" command *default* will be in the next available position, but *images* can be stored in any available position.

The *page* diagram will be updated continuous to reflect the positions that have a stored *image*.

Print a Page

Prints the page displayed.

Delete Defined

Defined *images* will be deleted first from the last stored position and then the reverse of the *default* store sequence. That is, they are deleted from bottom to top and from right to left.

Delete a Position

Enter the number value that corresponds to the desired delete position.

Delete a Page

Deletes the current page of images.

Page Function and Parameter Function

The monitor display is refreshed.

Image Setup

Overview

The following functions are available through the Image Setup Menu:

- F1 Window Width
- F2 Window Level
- F3 Border
- F4 Trim
- F5 Contrast
- F6 Image Dmin
- F7 Image Dmax
- F9 Change Key
    - F1 Curve Shape
    - F2 Curve Series
    - F9 Change Key
    - F10 Return

If an *option* is selected that is not available on this Laser Printer, the *Control Terminal* will sound an "Invalid Key" response.

Note

Refer to "Program Options" on page 4–12 to obtain details of the features listed above.

Common Text

Main Menu item number 4, "Common Text Setup," allows the specification of text that will be printed across the bottom of all films for that *imaging device*. It consists of 1 line of up to 80 characters, centered on the bottom of the film. The text can contain:

- the date that the film was printed.
- the time that the film was printed.
- the film count within the *study*.

  For example, 01/06 indicates the 1st of 6 films.
- any other text desired.

  For example, the hospital name and the *imaging device* could be placed at the bottom of the film.

When this item is selected, the *screen* displays the current text specification of the *imaging device* and the [F1] and [F2] keys are used to update or delete the text.

Update Text

If [F1] is selected, you can retype each line of text and then press [Enter]. In the process, change whatever items are necessary. Once [Enter] is pressed for a line, the system moves to the next line.

Important

The store date and time macros (%STORDAT%,%STM%, and%STORE_TIME%) print the dates and times that the Printer saved the images. The other macros provide the date and time that the films were printed, which may be later than the store date and time.

To print the print date, time, and/or page number for total pages in the study, type the following macros in the text:

Macro	Printed As	Example
%STORDAT%	dd-MMM-yy	29-OCT-92
%STM%	hh:mm	15:01
%STORE_TIME%	yyyyMMddhhmm	199406012315
%FOF%	nn/mm	1/06
%PRNTDAT%	dd-mmm-yy	29-OCT-92
%$TIME$%	hh:mm:ss	14:15:03
%TIM%	hh:mm	14:06
%SES%	CT1	CT1 (the source of the study)
%REPRINT_IDENTIFIER%	up to 11 numerical characters (as entered through the Keypad)	a unique patient identification number

Finally, the system asks you to specify "B" for black text or "C" for clear text and (S)ave, (R)evise or [Esc] to quit.

Deleting Text

If [F2] is selected, the system asks for a verification before the text is deleted.

Change Destination

Refer to the User's Guide for the *Kodak Ektascan* Network Interface.

Troubleshooting the Control Terminal

Blank Display Screen

If a terminal is not used for several minutes, the *screen* will become blank to protect the *screen* from "burning in" the characters. When the *screen* is blank, use the following sequence to refresh the *screen*:

1. Press any key.
2. If the *screen* did not refresh, turn the *Control Terminal* off and then on.
3. Check that the Laser Printer is functioning properly.
4. Check that the *imaging device* is communicating successfully with the Laser Printer. This will indicate whether or not the *interface* is responding.
5. If none of the above steps refresh the *screen*, contact your Service Representative.

Garbled Screen

If the user indicates a WYSE terminal specification when it is not a WYSE terminal, and makes a selection from the "Mode Selection Menu" with the non-WYSE terminal, the *Control Terminal* display may show a garbled message.

If the user presses [Esc] and the system returns to the "Mode Selection Menu," nothing further needs to be done.

If the terminal does not respond to the [Esc] key, the terminal parameters may have been changed by the error. Reset the parameters to their original values, and press [Esc]. At the "Terminal Selection Menu," select the correct specification.

Locked Screen

If the user inadvertently presses [Ctrl and the letter "S," the display terminal will appear to "lock" and not respond. This is a command that stops the *screen* from scrolling to allow a user to see a single *screen* of information. If this happens, press [Ctrl] and the letter "Q" to resume scrolling. The *screen* will "unlock" and respond normally.

Vertical Misalignment of Display Screen

The WYSE Set Up Menu may have been accessed and the Terminal characteristics were changed. To re-establish the WYSE terminal as a *Control Terminal*:

1. Press the [Set Up] key.
2. Press [F2].
3. Use the Space Bar until "WYSE 50+" is displayed in the upper-left corner.
4. Press the [Set Up] key.
5. Press the Space Bar until "Yes" is displayed.
6. Press the [Set Up] key.
7. The next *menu* item selected will re-align the Display Screen.

Error Codes

If a fatal *interface* error occurs, all *Control Terminal* activities will stop and will be replaced by a request for a Service Personnel password. If this occurs, turn the Laser Printer on and off. If the *Control Terminal* continues to request the Service Personnel password, contact your Service Representative.

Section 6: Calibrating the 2180 Laser Printer

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Overview

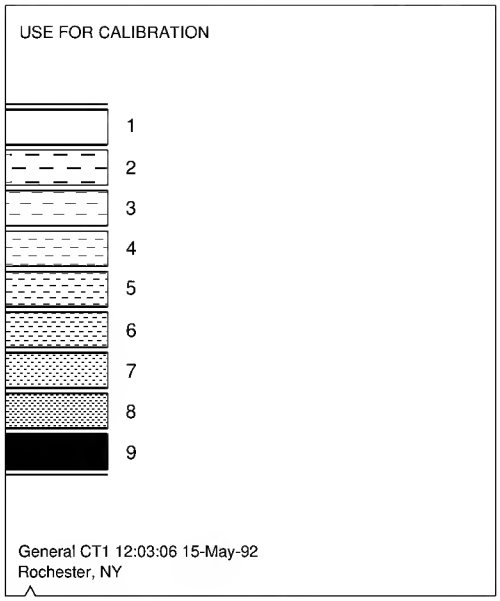
General Information

Calibration is a method of ensuring consistent *image* appearance, despite differences in film emulsions and variations in Processor chemistry.

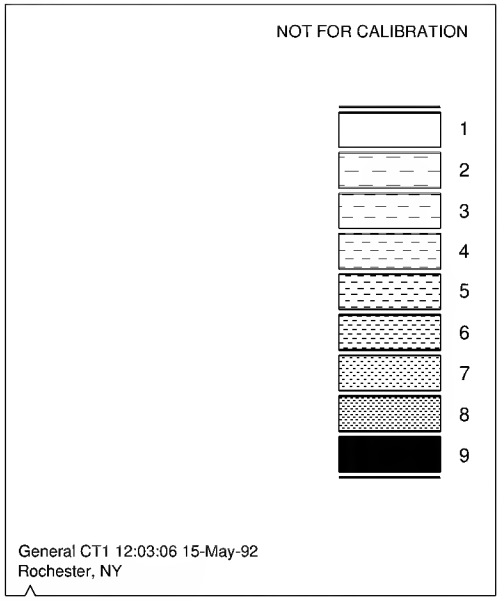
Images can be stored and printed at any time during *calibration*. If *calibration* takes place while the Laser Printer is printing, the new *calibration* takes effect only when all copies of the current *page* have finished printing.

It is important to understand the difference between *calibrating* the Printer and *calibrating* the *Densitometer*. *Calibration* of the *Densitometer* will be discussed in "Maintaining the Densitometer" in Section 8.

You should also understand the difference between the Calibration Test Film (see page 6–5) and the Calibration Results Film (see page 6–10).



calibration test film



calibration results film

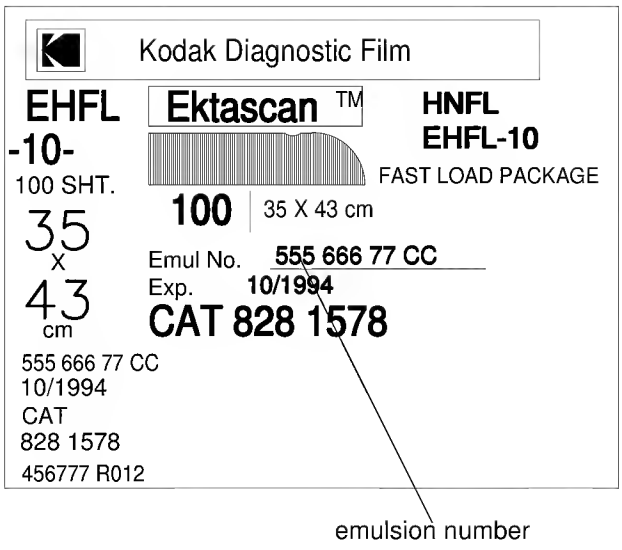
H126_2721CC

When to Calibrate

The *Kodak Ektascan* 2180 Laser Printer is designed to produce consistent, high quality *images* on film. To maintain optimum *image* quality, the Laser Printer should be re-calibrated when changing:

- film emulsion
- the chemistry, Processor temperature, or changing Processors

To determine whether the emulsion number has changed, read the label on the side of the box of film.



H126_2718GCA
H126_2718GC

Calibrating the 2180 Laser Printer

Using a Stored Calibration Table

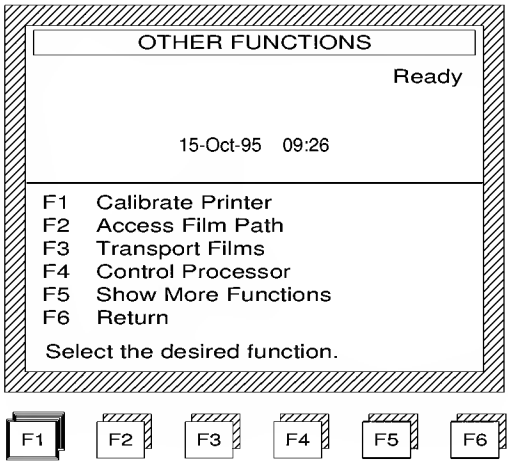
Caution

Successful entry of new *calibration* data for a *calibration* table results in the loss of existing data for that table.

Performing the Calibration

[1] Check that the Printer, and the Processor, if one is attached, is warmed up.

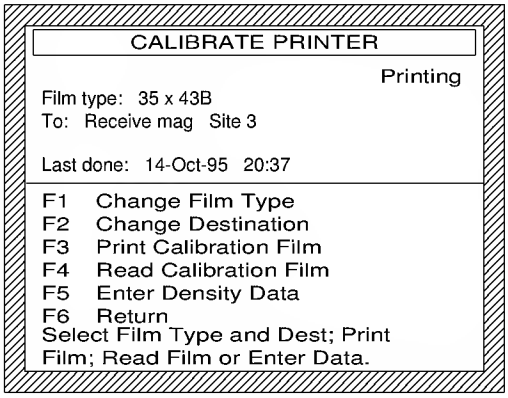
[2] Access the Other Functions Screen.



H126_9040AC

[3] Press [F1] from the Other Functions Screen to access the Calibrate Printer Screen.

Calibrate Printer Screen

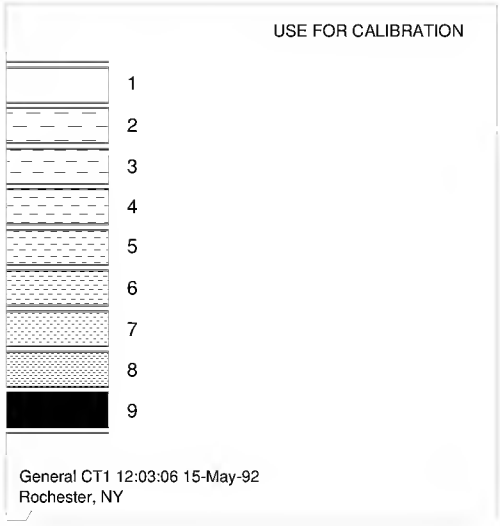

CALIBRATE PRINTER
Printing
Film type: 35 x 43B
To: Receive mag Site 3
Last done: 14-Oct-95 20:37
F1 Change Film Type
F2 Change Destination
F3 Print Calibration Film
F4 Read Calibration Film
F5 Enter Density Data
F6 Return
Select Film Type and Dest; Print Film; Read Film or Enter Data.

H126_9041AC

[1] The *screen* displays the film type and destination to be *calibrated*. Press [F1] to select the other film type that is presently installed in the Printer. This option is displayed only when two different film types are installed. The film type *field* will change to reflect the new film type. [F1] will be cleared if there is only 1 film type. Press [F2] to change the destination.

[2] Press [F3] to print the Calibration Test Film.

[3] Process the film and check that the information on the *screen* matches the destination printed on the film and the film type. If the information does not match, use [F1] and [F2] to select the correct values. The Calibration Test Film will look like the following illustration.



calibration test film H126_2722AC

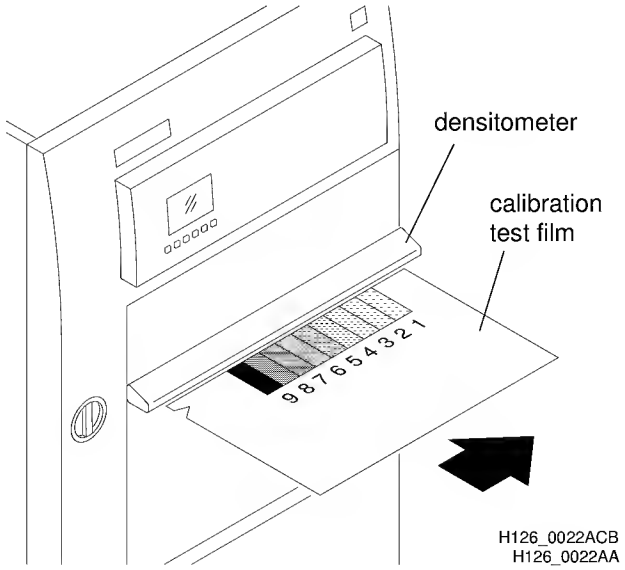
[4] Do **either** step 5 or step 6 to enter the *density* data into the Printer. In step 5, the *density* data is read by the built-in *Densitometer* and entered into the software of the Printer. Do step 6 if you measure the *density* values at an off-line *Densitometer* and then enter them at the Control Panel.

Note

Do not place the Calibration Test Film in the slot of the Densitometer until prompted to do so.

[5] Press [F4] to read the Calibration Test Film. The Printer will:

- *Clear* all commands and change the *prompt* to "Please wait."
- Change the *prompt* to "Slide calibration film through the densitometer."



You must slide the *calibration* film through the *Densitometer* within about 15 seconds. Use an even sweeping motion when sliding the film, otherwise a calibration error may occur.

When you slide the film through the *Densitometer*, the Printer displays the message, "Calibration in progress; please wait."

If the *calibration* is successful, the Printer changes the *prompt* to "Printer calibration successful."

If any errors occur during *calibration*, the Printer will display the Error Recovery Screen. The existing *calibration* table is not affected. Printed Errors and the Error Recovery Screen will be discussed in detail in Section 8, "Troubleshooting and Error Messages."

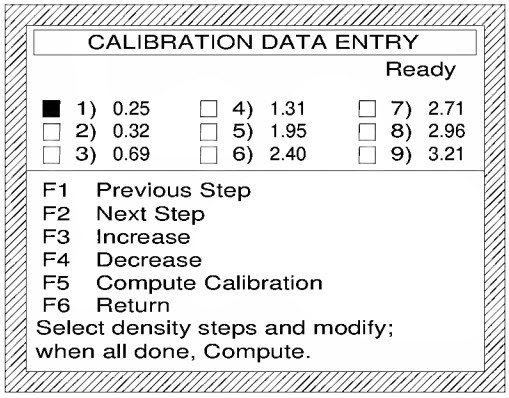
Press [F6] to return to the previous *screen*.

[6] Measure the *density* values at an off-line *Densitometer* and then press [F5] to enter the *density* data at the Control Panel.

Calibration Data Entry Screen

You may use another *Densitometer* instead of the built-in *Densitometer* that is on the front of the 2180 Laser Printer to measure the *density* values of the Calibration Test Film. If so, you should follow these steps to enter the *density* data into the Printer at the Control Panel.

Press [F5] at the Calibrate Printer Screen to display the Calibration Data Entry Screen.



H126_9044AC

[1] Press [F1] to select the previous *density* step, moving through the list in a circular manner.
Press [F2] to select the next *density* step.
Press [F3] to increase the selected value in the range of 0.00 to 3.99. The key may be held down in autorepeat mode.
Press [F4] to decrease the selected value in the range of 0.00 to 3.99. Repeat this process as many times as is necessary, and then continue to step 2.

[2] Press [F5] to compute *calibration*. If *calibration* is not successful, the Error Recovery Screen will be displayed. If the *calibration* is successful, the Printer changes the *prompt* to "Printer calibration successful."

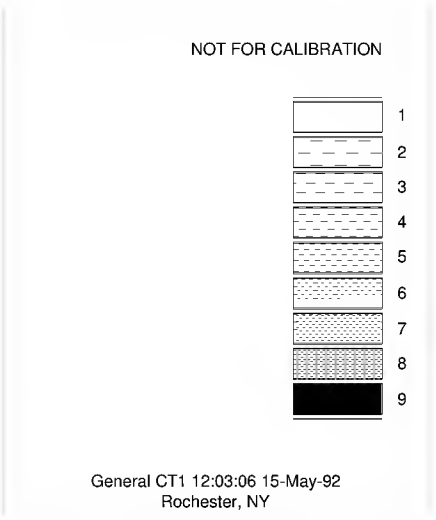
[3] Press [F6] to return to the previous *screen*.

Checking Calibration

You may check the *calibration* by printing the Calibration Results Film from the Print Test Films Screen.

Calibration Results Film

You may verify that the *calibration* was successful by checking the *density* of steps 1 - 9. They should be in equal increments.



calibration results film

H126_2723AC

Important

Do not use the Calibration Results Film to calibrate the Printer.

Section 7: Study Reprinting

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In This Section

This section provides information for reprinting *studies*. You can execute the Study Reprinting feature from the:

- Control Panel All systems have this capability. See "Study Reprinting from the Main Control Panel," page 7–4.
- Keypad This is an option that may be purchased separately. Please contact your Kodak Sales Representative for further details. See "Study Reprinting From the Keypad," page 7–10.

For detailed information on *study reprinting*, see the "KEYPAD Study Reprinting" Quick Reference Guide.

General Information

Study Reprinting provides the capability to reprint original patient *studies* that are stored on the 2180 Laser Printer image buffer disks. A *study* is a logical grouping of one or more *pages* which are to be printed together. *Studies* are created by an imaging device and are stored by the Printer. Once a *study* enters the print queue, it is known as a job; however, after the job is printed, the *study* remains on disk until it is deleted.

Protected vs Unprotected Studies

Studies may be protected or unprotected (see "Protected and Unprotected Studies," page 7–8.

- Protected *studies* remain on the system until they are manually deleted. To prevent a *study* from being deleted, protect the *study*.
- Unprotected *studies* remain on the system as long as there is space on the buffer disks. When the disks are full the oldest *studies* are deleted. The number of *studies* that are on disk depends on the total size of all the stored *studies* and the number of disks installed with the system.

How Studies Are Stored

When a page is completed, it is automatically given a date and time stamp regardless of the method of filming (keypad mode or autofilming). See "Storing Images and Printing Pages," page 4–5. Additionally, each *study* is identified by the "source" where the image or images were generated.

Optionally, if "Keypad Study Reprinting" is installed, *studies* may be identified by a unique "study number." See "Storing Studies at the Keypad," page 7–10.

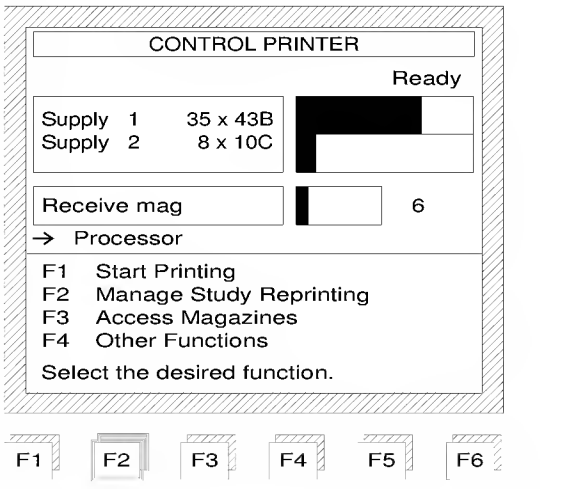
To select *studies* for reprinting from the:

- Control Panel First select the source and then the particular *study* by date and time.
- If a single source has been selected, only the *studies* from that source will be available.
- Keypad If you have the Keypad Option installed, you may select a *study* based on a single source or all sources, date and time, or study number, depending on the *study* and sorting options that have been set up in advance or that you specify from the keypad at the time the *study* is reprinted.

Study Reprinting From the Main Control Panel

Manage Study Reprinting

You can access a patient *study* for reprinting from the Main Control Panel. Select [F2] to access Manage Study Reprinting.



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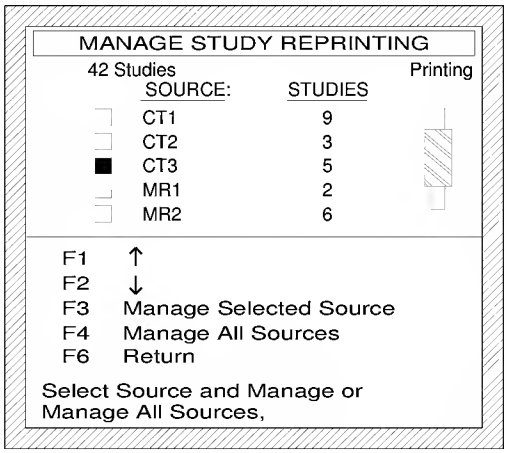

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For up to 5 sources, the Printer Screen Displays:

- **Source** - a 5 character name for the *imaging device*. The Printer Display "~~~~~" sorts if a source name is not defined for that source.
- **Studies** - completed *studies* stored in the Printer for each source.
- **Scroll Bar** - shows the position of the displayed sources relative to the entire list of sources.

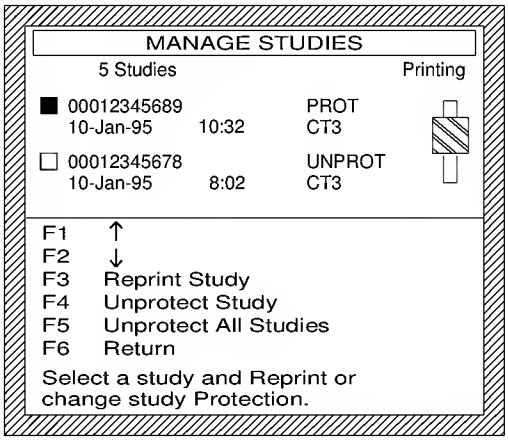
Select [F1] or [F2] to see sources that are not displayed, and to select a source.

Select [F3] or [F4] if you want to print *studies* from one source or all sources. The Printer displays the total number of *studies* selected from the Manage Study Reprinting screen.

The Printer displays:

- Date and time that the *study* was stored
- Source name as displayed in the Manage Study Reprinting screen
- Protected (PROT) or Unprotected (UNPROT) status
- A scroll bar that shows the position of the displayed *studies* relative to the entire list of selected *studies*

The display is updated as *studies* are added or deleted. If there are no closed *studies*, the scroll bar and all commands except "Return" are cleared.



H126_9111AC

Reprint Study

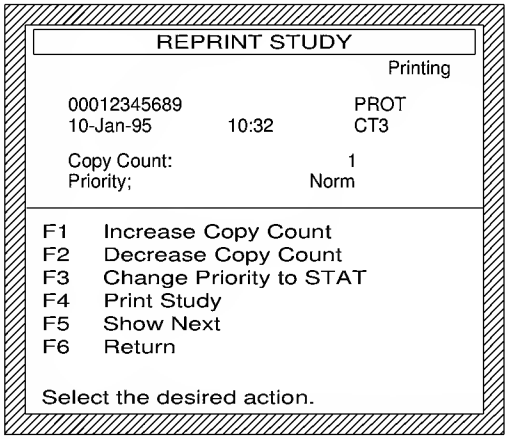
Select [F3] Reprint Study from the Manage Studies screen. Reprinting a *study* will send a job to the print queue. When "Reprint Study" is selected, the Printer displays the *study* selected for reprinting.

Upon entering this screen, the copy count *defaults* to 1, and the print priority to Norm. Copy count can be from 1 to 255. Select [F1] or [F2] to change the copy count.

Priority status toggles between NORM for normal priority or STAT for emergency priority. Select [F3] to change the priority.

Select [F4] to place the *study* in the queue for reprinting.

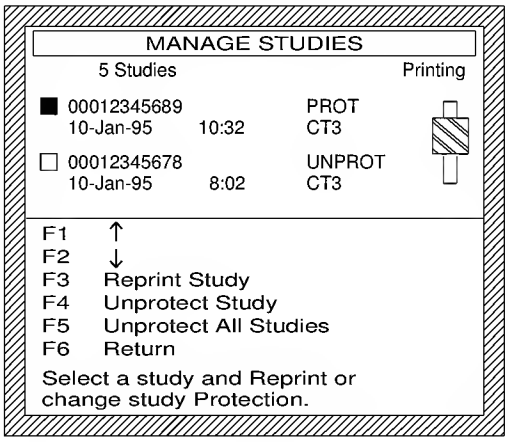
Select [F5] to display the next *study* in the list. If there are no more *studies*, this command is cleared.



H126_9112AC

Protected or Unprotected Studies

Studies can be protected or unprotected. Protected *studies* will never be deleted automatically. Unprotected *studies* will be deleted when necessary to make space for new *studies* to be stored.



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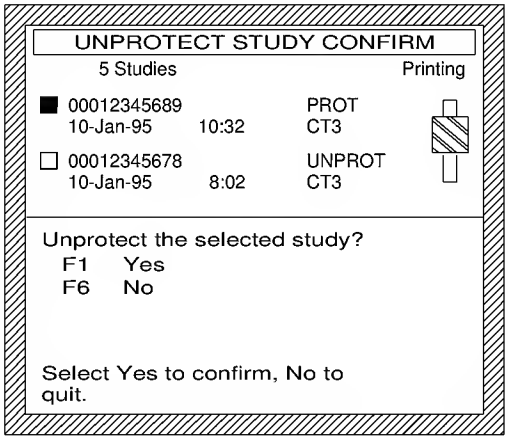
Note

"Protecting" *studies* reduces the number of new *studies* that can be stored.

If a protected *study* is selected and the [F4] key is selected, or if the [F5] key is selected from the Manage Studies screen, the Unprotected Study Confirm screen is accessed to confirm your selection.



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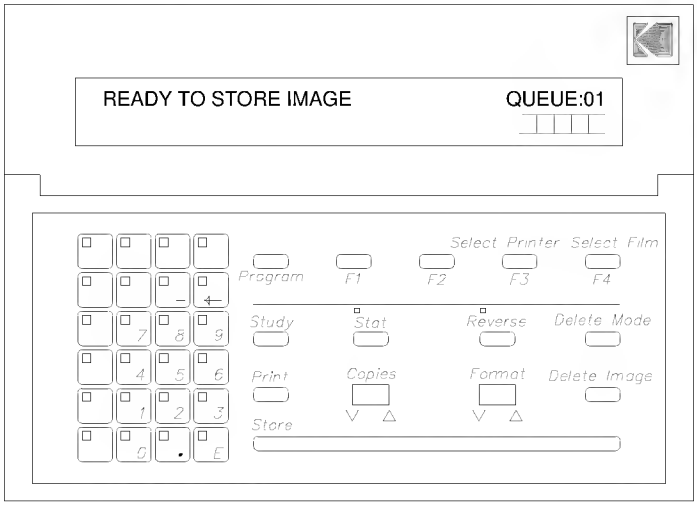
Keypad

Overview

You can display sorted information, and reprint a *study* at the Keypad. See the illustration below to review the Keypad.



H126_2713BC

Options available at installation include:

- Study#, Page #
- dd mm yyyy, mm dd yyyy, yyyy mm dd
- 24 hour or 12 hour

Study Mode vs Page Mode

By selecting the "Study Mode" at the Keypad, you can reference *studies* for printing. If you select the "Page Mode" of operation, each *page* will be referenced as a *study*.

If the *Study Reprint* feature is used often, it is recommended that the "Study Mode" versus the "Page Mode" be selected at the Keypad to reduce the number of *studies* needing to be referenced.

Storing Studies at the Keypad

Optionally, if "Keypad Study Reprinting" is installed, *studies* may be identified by a unique "study number." When a *study* is generated and stored, it is assigned a number

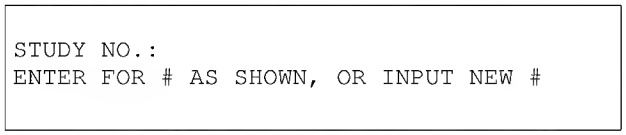
which may be a patient's Social Security number or any unique number. The study number must be numerical and not exceed 11 characters. The form of the study number is determined by the hospital and configured by the service provider when the system is installed.

Study numbers are assigned at the Keypad when the *study* is stored.

- If the Keypad is in Page Mode, you will be prompted to accept or change the study number after each page.
- If the Keypad is in Study Mode, each page of the *study* will have the same number.

With the Keypad Option installed, in addition to date and time and source, you will have the added convenience of reprinting *studies* based on the study number. Additionally you will be able to change the order of the display so that either date and time or study number displays at the top right of the screen.

To Store a *Study* Using a Study Number



[1] From the screen shown above, type the study number and press [e]. The following screen displays.

[2] Press [Store].

Reprint Options

The Reprint Options Menu is the F3 selection of the Program Menu. This menu allows the user to reprint images that are stored as pages or *studies*.

```
F1 STUDY OPTIONS            F2 SORTING OPTIONS
F3 REPRINT OPTIONS          F4 UNAVAILABLE
```

Study Options

Study Options allows you to set up all sources or a single source for searching for *studies*. Once you have set up a single source, only the *studies* from that source will be available for display and reprinting. To change the source setting press:

[Program]

[F3]

[F1]

The following screen displays.

```
    CURRENT SETTING:  MANAGE ALL SOURCES
F1  MANAGE STUDIES FOR CT3, OR ENTER
```

Press [Enter] to select this setting, or press [F1] to select Manage Studies For CT3 or any other source. With this setting selected, only the pages or *studies* from the selected device can be recalled at the keypad for reprinting. You may change the source selection at any time.

Note

The use of CT3 is only for example. Your imaging device name will display.

By pressing [F1] again, the screen changes to the one below.

```
    CURRENT SETTING:  MANAGE STUDIES FOR CT3
F1  MANAGE ALL SOURCES, OR ENTER
```

Press [Enter] to accept this setting, or press [F1] to select Manage All Sources. With this setting selected, the pages or *studies* from all devices connected to the printer can be recalled at the keypad for reprinting.

Sorting Options

Sorting Options allows you to set up *defaults* that define how the *studies* will be organized and displayed for reprinting. *Default* sort options include:

- Study# — A unique number, up to 11 digits in length, which identifies a page or a study.
- Date, Time — The date and time the page or *study* was initially stored

Once the Study Option (source *default*) and the Sorting Options *defaults* are set up, only the *studies* from the defined source will be available for reprinting. In addition, the *studies* will display in the defined order as shown in the table below:

If you select:	The display order is:
Sort by Study#	Study number Date Time
Sort by Date and Time	Date Time Study number

You may change the Sorting Options at any time using the following procedure:

[1] From "Ready to Store Image" screen or the "Enter Study Number" screen, press:

[Program]

[F3] "Reprint Options"

[F2] "Sorting Options"

[F4] The current setting displays. See the screen below which displays the Sorting Option, Sort by Study#:

```
CURRENT SETTING:  SORT BY STUDY#
PRESS F1 FOR SORT BY DATE,TIME OR ENTER
```

[2] To accept the displayed option, Press [Enter], or press [F1] to select the other setting, in this case, Sort By Date, Time

- When you choose Sort by Study#, all of the *studies* in the data base are sorted and available for display by study number, starting with the lowest number. Subsequent *studies* can be viewed by scrolling backward (Back) or forward (Next).
- When you select Sort by Date, Time, all of the *studies* are sorted and available for display with the most recent *study* first. Other *studies* on the same date are ordered by the time within that date.

Selecting and Reprinting Images

When you search for a *study* using "Select", the data will display in the order that you have indicated on the "Select" screen. The "Select" feature allows you to define the order of the display for this search only. The *default* sorting options set up in the "Sorting Options" page will not be affected.

Reprinting a Study Using Date

To reprint a *study* based on the date it was stored, do the following steps.

```
ENTER STUDY NUMBER:
ENTER FOR # AS SHOWN, OR INPUT NEW#
```

```
READY TO STORE IMAGE
```

[1] From either of the screens shown above, press [F1]. The following screen displays.

```
PRESS F1 TO REPRINT LAST STUDY
F2 REPRINT OPTIONS, OTHER KEYS TO EXIT
```

[2] Press [F2] to select a previous *study* for reprinting. The following screen displays:

```
F1 SELECT BY #              F2 SELECT BY DATE, TIME
F3 SHOWN DEFAULT LIST, OTHER KEYS TO EXIT
```

[3] Press [F2] to select the *study* by date and time. The screen below displays:

```
DATE SELECTION
F1 TODAY'S DATE  F2 ENTER DATE  F3 QUIT
```

[4] Press [F2] to display the "Date Entry" screen.

[5] On the "Date Entry" screen, type the date of the *study* you want retrieved for reprinting.

Note

If you enter a date that is invalid, the message "Invalid Date; Please Re-enter" displays.

The "Study# Entry" screen displays.

[6] After you type the date, press [E]. The "Time Selection" screen displays.

[7] Enter [F1] for AM or [F2] for PM. The "Time Entry" screen displays.

[8] Type the time of the *study* you want to reprint, and press [E].

Note

If you enter a time that is invalid, such as 1269, the message "Invalid Time; Please Re-Enter" displays.

The message "Study Search in Progress; Please Wait" displays briefly. Then the closest matching *study* displays on the screen. Because you selected Date, Time, the date and time displays first with the study number following it as shown in the example below:

```
  03/23/1995  03:51PM  00123456789       CT3
F1 BACK    F2 NEXT    F3 PROTECT    F4 QUIT
```

From this screen, you may scroll backward [F1] or forward [F2] to find the exact *study* you want to reprint, or you may press [F3] to protect the *study* (see "Protected or Unprotected Studies", page 7–8.

[9] When the correct study number displays on the screen, press [Print] to print the job.

Reprinting a Study Using Study#

To reprint a *study* based on the study number, do the following steps.
As an example, we want to reprint a *study* that was stored as the study number 00123456789.

```
ENTER STUDY NUMBER:
ENTER FOR # AS SHOWN, OR INPUT NEW#
```

```
    READY TO STORE IMAGE
```

[10] From either of the screens shown above, press [F1]. The following screen displays.

```
PRESS F1 TO REPRINT LAST STUDY
F2 REPRINT OPTIONS, OTHER KEYS TO EXIT
```

[11] Press [F2] "Reprint Option" to reprint a previous *study* for reprinting. The following screen displays.

```
F1 SELECT BY #          F2 SELECT BY DATE, TIME
F3 SHOWN DEFAULT LIST, OTHER KEYS TO EXIT
```

[12] Press [F1] to select the *study* by Study#. The "Study# Entry" screen displays.

[13] Type the study#, and press [E].

The message, "Study Search in Progress; Please Wait" displays briefly. Then the closest matching *study* displays on the screen. Because you selected Study#, the study number displays first with the date and time following it as shown in the example below:

```
   00123456789   03/23/1995  03:51PM    CT3
F1 BACK    F2 NEXT    F3 PROTECT    F4 QUIT
```

From this screen, you may scroll backward [F1] or forward [F2] to find the exact *study* you want to reprint, or you may press [F3] to protect the *study* (see "Protected or Unprotected Studies", page 7–8.

[14] When the correct study number displays on the screen, press [Print] to print the job.

Section 8: Troubleshooting and Error Messages

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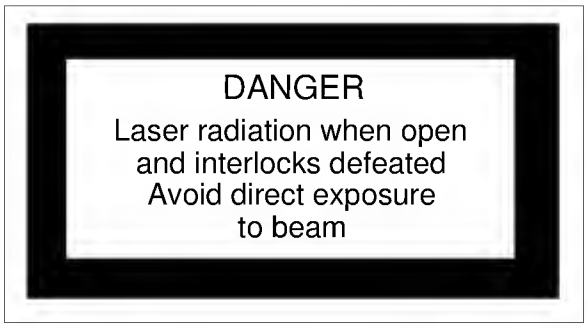
Troubleshooting

Overview

This section will provide suggestions for what to do if problems arise. After an overview of the path that the film takes through the 2180 Laser Printer, this section will give you guidelines for clearing film jams.

In order to clear film jams, you must open the Film Door of the Printer.

Before opening the Film Door, read the Safety Information that is provided at the beginning of this manual and note the location of the *laser* beam in the Printer.



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Warning

DANGER. AVOID *LASER* BEAM. THIS EQUIPMENT USES A VISIBLE RED *LASER*. *LASER* RADIATION CAN BE PRESENT WHEN THE MACHINE IS OPERATED WITH THE PANELS OFF AND THE INTERLOCKS DEFEATED. AVOID DIRECT EXPOSURE TO THE *LASER* BEAM.

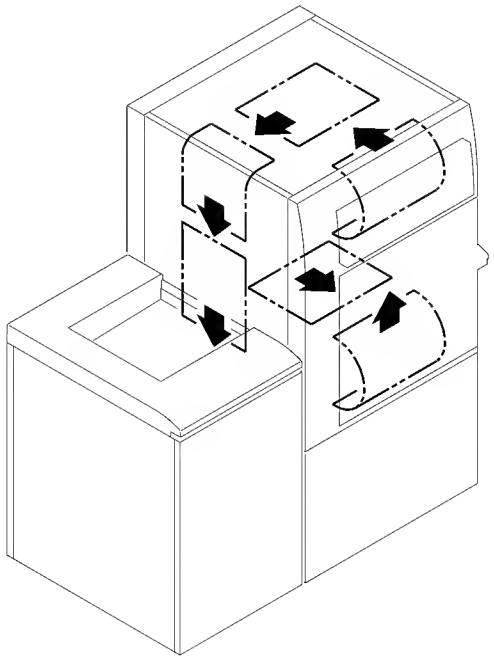
Film Transport

Overview

The Transport Films function can be selected from the Other Functions Screen to move film through the Printer and Processor without printing on the film. This may be used for processing a pre-exposed sensitometric film, to clear out fogged films from the Supply Magazine, or to move preprinted films to the Processor. The Transport Films Screen is discussed in Section 3.

Film Transport with a *Kodak X-Omat* 180 LP or 180 LPS Processor

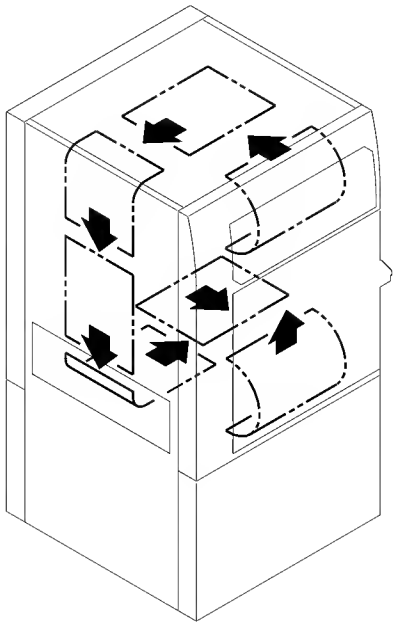
The Picker Assembly picks up a piece of film from one of the two Supply Magazines, and the Elevator lifts the Picker and the film up to the Registration Assembly. The film is squared on the Registration Table and pushed to the left. The Slow Scan Assembly moves the film smoothly and holds it in focus while the film is being exposed by a *laser.* The laser is located in the Fast Scan Assembly. Next, the piece of unprocessed film goes down a chute in the Exposed Film Path Assembly and onto the Receive Magazine, or exits the Laser Printer through the Processor Docking Assembly to the docked 180 LP or 180 LPS Processor.



H126_0708GA

Film Transport with Receive Magazine

This view shows the film path without a docked 180 LP or 180 LPS Processor. The exposed film goes to an internal Receive Magazine.

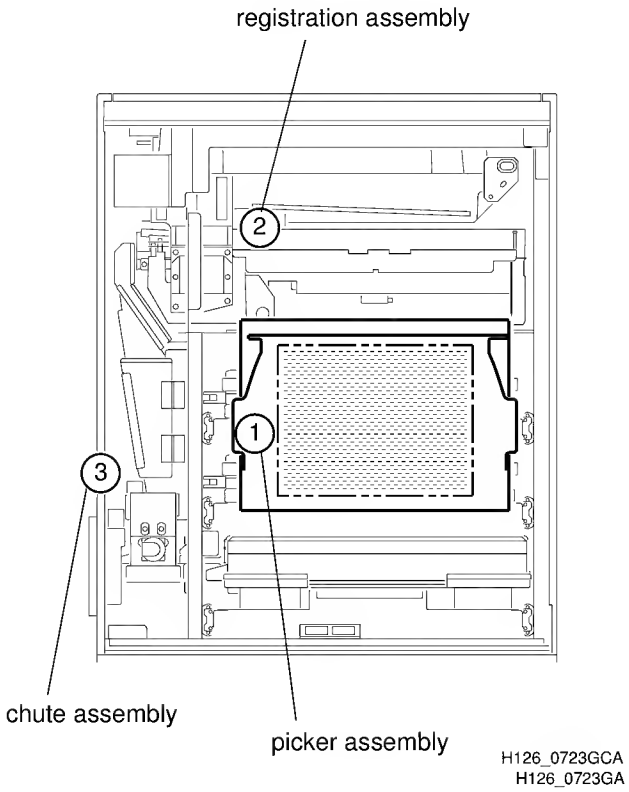


H126_0707GA

Film Jams

If a film jam occurs, the Display Screen of the Control Panel will display a message to tell you where to look.

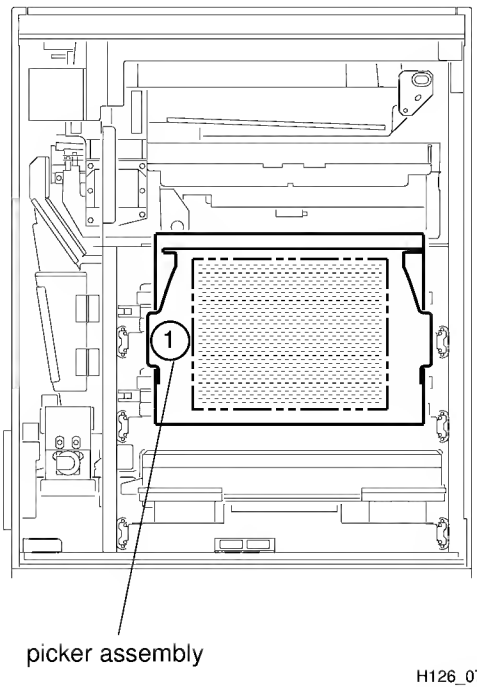
Inside the Film Door is a label which suggests where to look for film jams.



Film jams may occur in the following places:

- the Picker Assembly
- the Registration Assembly
- the Chute Assembly

The illustrations on the following pages identify each of these areas.



H126_0724GCA
H126_0724GA

Check the Picker Assembly for film jams.

[1] Press down to lower the Film Pocket.

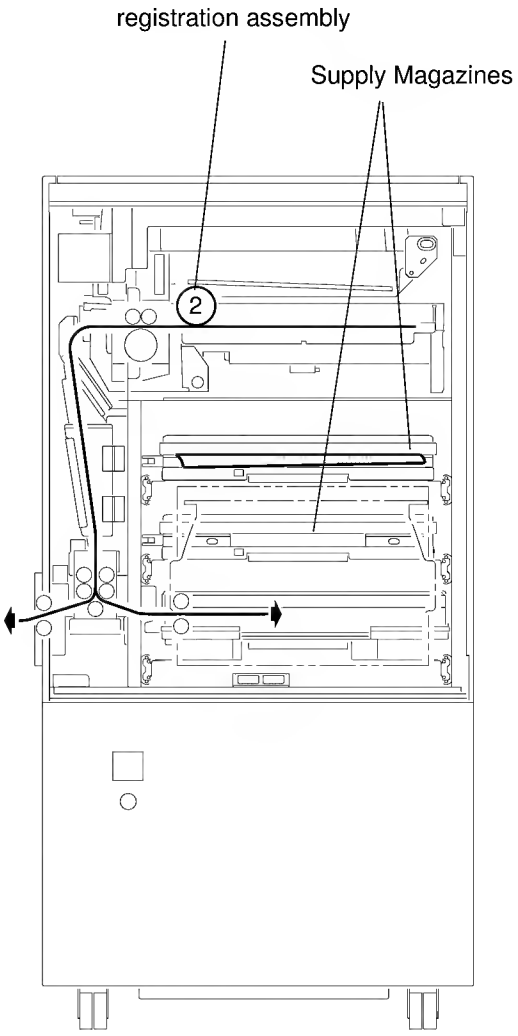
[2] Carefully raise the Picker.

[3] Check the Supply Magazine. Any exposed film must be destroyed.

[4] Check the Receive Magazine. If film is partly in the Receive Magazine, close the Printer door and press "Start Printing" to automatically pull the film into the Receive Magazine.

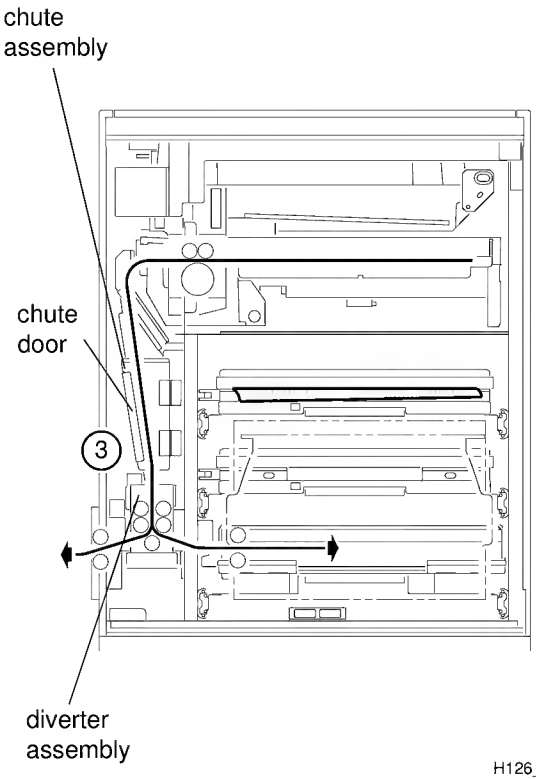
[5] Carefully lower the Picker Assembly. Lift the cover of the Picker and remove the film.

[6] Check the Registration Assembly for film jams. If film is in the Rollers, pull it out.



H126_0725CCA
H126_0725CA

[7] Open the Chute Door to check the Chute and Diverter Assemblies for film jams. If the film is stuck in the rollers, pull it out.



H126_0726GCA
H126_0726GA

Caution

If film has gone partly into the Processor, open the lid of the Processor and pull the film out through the Processor and not back through the Printer. If the wet film is pulled back through the Printer, the chemicals will cause damage to the Printer parts.

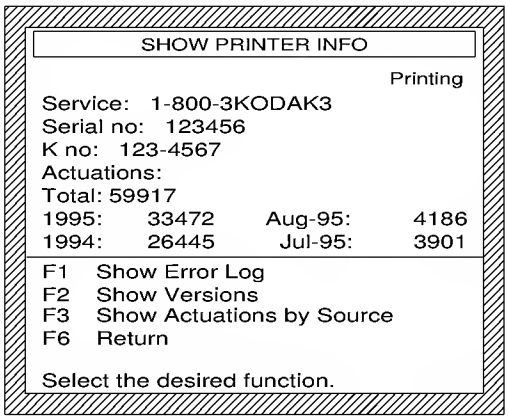
Error Messages

General Information

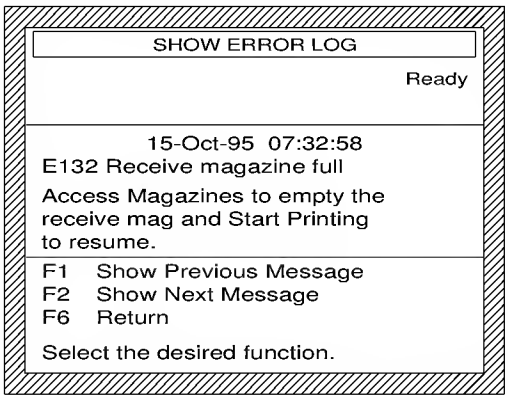
Error Messages for the 2180 Laser Printer and the 180 LP or 180 LPS Processor display on the Display Screen that is located on the Laser Printer.

Show Error Log Screen

Press [F1] from Show Printer Info Screen to display the Show Error Log Screen



H126_9035AC


SHOW ERROR LOG
Ready
15-Oct-95 07:32:58
E132 Receive magazine full
Access Magazines to empty the receive mag and Start Printing to resume.
F1 Show Previous Message
F2 Show Next Message
F6 Return
Select the desired function.

H126_9042AC

The Printer displays the error log of the message number and the latest message in reverse chronological order. See the Error Recovery Screen for a description of error messages.

Press [F1] to display the previous (earlier) message.

Press [F2] to display the next (later) message.

Press [F6] to return to the previous *screen.*

Error Recovery

The *screen* displays when the Printer detects an error. The *screen* that is currently displayed is suspended. You will be able to view the error message(s). To exit, you have 2 choices:

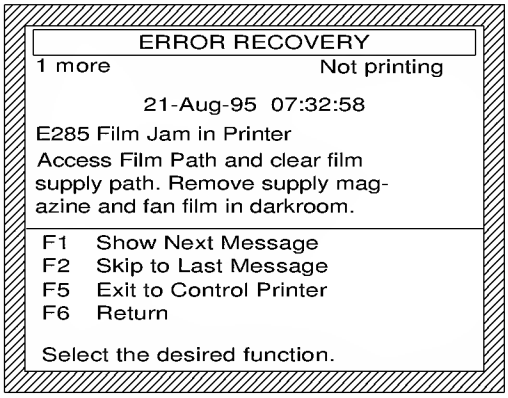
- Select "Return".
  The suspended *screen* resumes at the point it was suspended. You can continue the work you were doing and later recover from the error condition.
- Select "Exit to Control Printer" to display the "Control Printer" *screen.*
  The suspended *screen* is aborted and the Control Printer Screen displays. This *option* allows you to immediately begin entering the commands that are needed to effect error recovery.

This *screen* shows all new errors that have not been previously displayed. The errors display in chronological order. If there are remaining error messages to display, you may:

- View all of the messages before selecting one of the above exit choices.
- "Skip to Last Message" to skip over the messages in the new error list. Those errors will not be displayed again in this *screen*, but you may view them later at the Show Error Log Screen. At this point, you may select one of the above exit choices.

In addition to reporting errors at this *screen*, the Printer displays Interface errors at the Keypad, Auxiliary Keypad or the *Control Terminal*, or passes them to the *autofilming* console for the imaging device.

Error Recovery Screen


ERROR RECOVERY
1 more
Not printing
21-Aug-95 07:32:58
E285 Film Jam in Printer
Access Film Path and clear film supply path. Remove supply magazine and fan film in darkroom.
F1 Show Next Message
F2 Skip to Last Message
F5 Exit to Control Printer
F6 Return
Select the desired function.

H126_9043AC

The Printer blinks the *screen* title line, and displays the error message in the highlighted bar at the top of the screen so that this *screen* may be noticeable at a distance from the display.

The Printer displays a count of remaining error messages. The error message includes:

- Time and date
- Error Message, including a severity level (F=fatal, W=warning, E=error) and error number.
- One to three lines of suggested recovery action.

Press [F1] to display the next error message and decrement the count of remaining messages.

Press [F2] to skip any messages and display the last (most recent) message in the new error list.

Press [F5] to "Exit to Control Printer" and display the Control Printer Screen. This command *option* is *cleared* if there are more messages to display, or the printer state is Off-line. It is *enabled* when there are no more messages.

Press [F6] to return to the suspended *screen*. This command is *cleared* and *enabled* as above.

Preventive Maintenance

Cleaning and Sterilization

The *Kodak Ektascan* 2180 Laser Printer is not to be cleaned by immersion nor sterilized by *autoclaving*. Do not wash in a manner allowing fluid to flow freely over the external surfaces. To properly sterilize or clean:

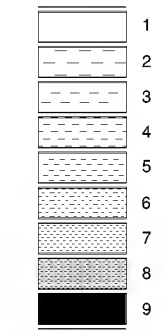
- power down the unit.
- immerse a clean, soft cloth in an appropriate non-abrasive, non-corrosive sterilizing or cleaning solution.
- wring cloth to remove excess fluid.
- wipe the external surfaces free of soil.

Exercise caution around openings and electrical connections. When soil is removed, wipe external surfaces dry with a clean or sterile soft cloth.

Maintaining the Densitometer

The Reference Strip is used to *calibrate* the *Densitometer* on the front of the 2180 Laser Printer. The *Densitometer* is *calibrated* at installation time, but the Reference Strip can be used periodically to check that the *Densitometer* is still properly *calibrated.*

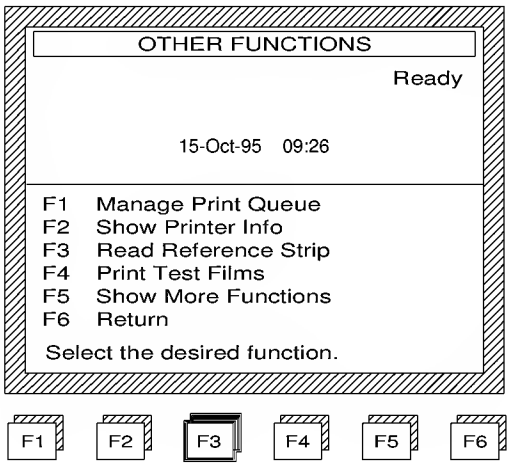
A Reference Strip is delivered with each Printer. It can be found in the pocket on the inside of the Film Door of the Printer. Replacement Reference Strips can be purchased separately by ordering part number 748682.



reference strip

H126_2724AC

Press [F3] at the Other Functions Screen to Read the Reference Strip.

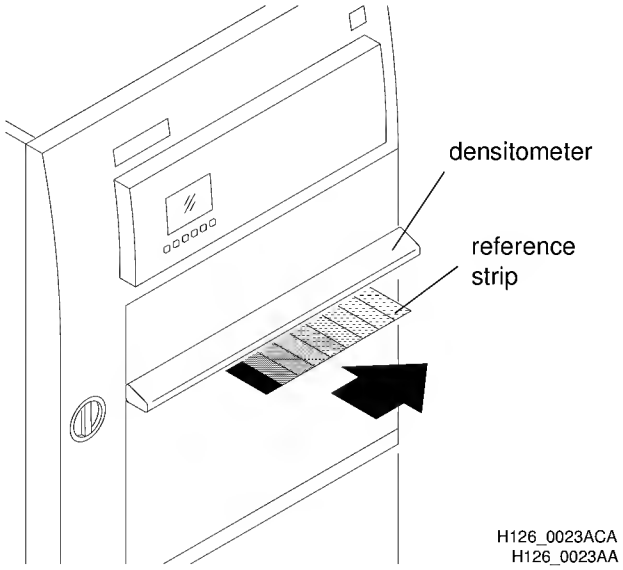


H126_9045AC

When the [F3] function key is pressed, the Printer changes the *prompt* to "Please wait," and then to "Slide reference strip through the densitometer."

Note

Do not place the Reference Strip in the slot of the Densitometer until prompted to do so.



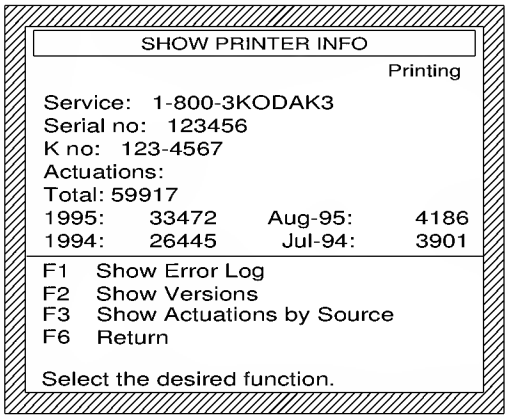
You must slide the Reference Strip through the *Densitometer* within about 15 seconds. Use an even, sweeping motion when sliding through the Densitometer.

When you slide the Reference Strip through the *Densitometer*, the Printer displays the message, "Densitometer calibration successful." The Printer will return to the Display Screen as shown above.

If any errors occur during *calibration*, the Printer displays the Error Recovery Screen.

How to Contact Service Personnel

Before placing a service call, you should know the K number for your system. The K number displays on the Show Printer Info Screen as shown below. See Section 3, "Basic Operations," for more information.



H126_9046AC

[1] Call the Kodak System Response Center for assistance. The Show Printer Info Screen displays the correct number.

[2] Be prepared to leave a message and the K number for your system.

A Service Representative will contact you to get more information about the nature of your system problems and take necessary actions to get your Printer working again.

Section 9: Quick Reference Guides

Flowchart for Operator Interface Screens

KEYPAD Study Reprinting Features Flowchart

Section 10: Safety Information for the 180 LP or 180 LPS Processor

Read and understand all instructions before using.

Warning

This equipment is not intended to be located in the patient's vicinity.

Caution

This device is intended for use only by professional, trained personnel.

Note

Noise emission is less than 65 dBA.

Warning

DANGER. HIGH VOLTAGE.

This equipment is operated with hazardous voltage which can shock, burn, or cause death. Remove the wall plug before servicing equipment. Never pull the cord from the outlet. Grasp the plug and pull to disconnect. DO NOT operate equipment with a damaged power cord. Position the power cord so that it will not be tripped over or accidentally pulled.

Warning

DO NOT use an extension cord to power the processor. Connect this equipment to a grounded outlet. Refer to the Site Specifications for the *Kodak Ektascan* 2180 Laser Printer and the *Kodak X-Omat* 180 LP Processor for additional details.

Warning

This equipment complies with the requirements in part 15 of FCC Rules for a class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and TV reception, requiring the operator to take whatever steps may be necessary to correct the interference.

Responsibility of the Manufacturer

The manufacturer is responsible for the effects on safety, reliability and performance of the *Kodak X-Omat* 180 LP or 180 LPS Processor only if:

- assembly operations, extensions, readjustments, modifications or repairs are carried out by persons authorized by the manufacturer.
- the electrical installation of the relevant room complies with the appropriate requirements.
- the *Kodak Ektascan* 2180 Laser Printer is used in accordance with the instructions for use.

Section 11: Processor Overview

Table of Contents

Description	Page
Introduction	2
General Information	2
Control Processor Screen	3
Process Information for the 180 LP or 180 LPS Processor	6
Processor Configuration and Setpoints	7
Using the Access Code	8
Processor Setup Access Screen	9

Introduction

General Information

The *Kodak X-Omat* 180 LP or 180 LPS Processor is a self-threading roller-type film processor that is designed only to be integrated with the *Kodak Ektascan* 2180 Laser Printer. The *Kodak Ektascan* 2180 Laser Printer can operate without the *Kodak X-Omat* 180 LP or 180 LPS Processor, but the Processor cannot operate without the 2180 Laser Printer. The Processor must be connected to the Printer to receive information and film from the Printer.

The 180 LP or 180 LPS Processor uses a single-speed Film Transport Motor and has four racks. They are the Developer, Fixer, Wash, and Dryer Racks. The Processor operates at the speed of 63 inches per minute. The Receive Magazine in the 2180 Laser Printer can be used in addition to the 180 LP or 180 LPS Processor, or instead of the Processor. For example, if two different types of film are loaded in the two Supply Magazines of the Laser Printer, the Processor could be set up with chemistry to process one type film while the other type of film could be collected in the Receive Magazine to be processed in a remote Processor.

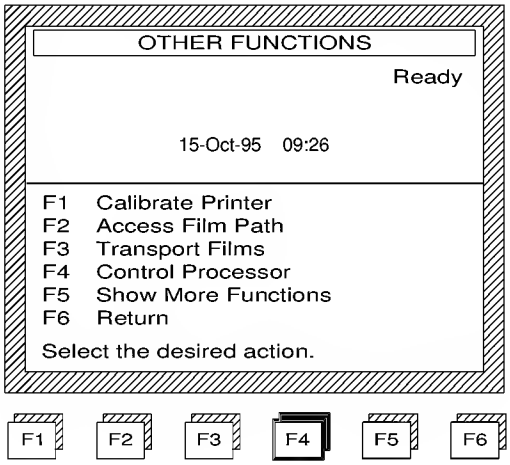
The *Kodak X-Omat* 180 LPS Processor has a 9 Bin Film Sorter installed at the factory. To improve productivity, each Sorter Bin usually receives films from a particular imaging device connected to the Laser Printer.

Kodak RP chemicals and *Kodak Ektascan* HN or HNC *laser* imaging films (code EHN-10 and EHNC-10) are recommended for use with the 180 LP or 180 LPS Processor.

Control Processor Screen

The user selects, changes, and monitors processing variables for the Processor through the Control Processor Screen at the Display Screen for the *Kodak Ektascan* 2180 Laser Printer.

Select [F4] at the Other Functions Screen to see the Control Processor Screen.



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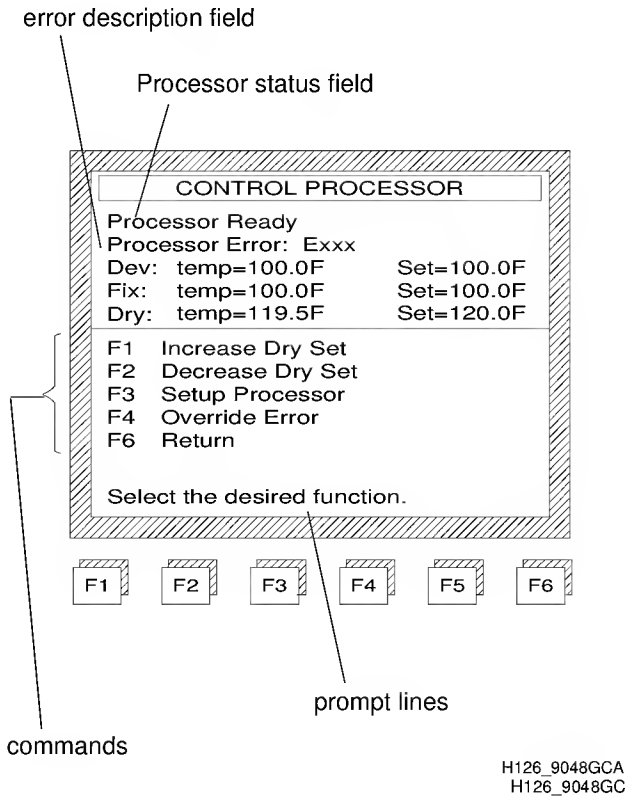


The Processor Status *field* indicates the current condition of the Processor. These conditions are "Processor Ready," "Processor Not Ready," "Film in Processor," or "Processor Off-line."

The error description *field* provides an error number of any error that may occur in the Processor, such as, "Processor Error: E134." When errors are initially reported, the Error Recovery Screen displays the error text. After returning to this *screen*, just the numeric code will appear as illustrated above. If this error is a Processor error that the user chooses to override, this line will be displayed in flashing mode. If there is not an error, this line will be blank. There are 3 errors that you can override. They are "E132 Developer under temperature," "E133 Developer over temperature," and "E134 Dryer under set temperature."

Processor Error Messages are listed and described in Section 18 on page 18–15.

If the Processor Status line does not show that the Processor is off-line, then the Developer, Fixer, and Dryer actual temperatures and temperature setpoints are displayed. Decimal points or commas and temperature scale (Fahrenheit or Celsius) are selected at the time of the configuration of your Printer.

Press [F1] to increase the dryer setpoint in increments of 1.0° Fahrenheit (or 1.0° Celsius, depending on which temperature scale was selected for your site).

Press [F2] to decrease the dryer setpoint in increments of 1.0° Fahrenheit (or 1.0° Celsius).

Press [F3] to display the Processor Setup Access Screen. This selection only appears as an *option* on the *screen* when there is no film in the Processor.

Press [F4] to continue even though an error condition relating to temperature warnings exists. If the Error description *field* is blank, or if it describes an error that cannot be overridden, this *option* will not be available.

Press [F6] to return to the Other Functions Screen.

Process Information for the 180 LP or 180 LPS Processor

Process Time, seconds	Drop Time seconds	Film/Chemical	Throughput films/ hr.
63	79	HN/HNC film, RP chemicals	180

Process Time is the time that it takes the leading edge of a sheet of film to travel from the Entrance Detector Rollers to the Exit Rollers of the Dryer Rack.

Drop Time is the time it takes the leading edge of a 35 x 43 cm (14 x 17 inch) sheet of film to enter the Entrance Detector Rollers and the trailing edge to exit the Dryer Rack when the 35 cm side is fed first.

Film/Chemical is the combination of film type and chemicals that is required for optimum *image* quality when using the Processor. *Kodak RP X-Omat* Developer Replenishment and *Kodak X-Omat* Fixer Replenishment, or equivalents, may be used. Contact your Kodak Representative to discuss the best option for your needs.

Throughput is the number of 35 x 43 cm sheets of film that can be processed in one hour.

Processor Configuration and Setpoints

Setup information consists of the film processor configuration and process setpoints. Setup information that was preset at the factory is listed below.

Setup information is stored in battery backed-up RAM (Random Access Memory). Therefore, you do not need to program new values every time that you turn on the Processor. **Even if power to the Processor is interrupted or the Processor is turned off, you do not need to program the Processor.**

If you wish, you may change the setup information by using the function keys on the display panel. See Section 13, "Setting Up the Processor," for more information. The new setup information will be retained in memory when power is interrupted or turned off.

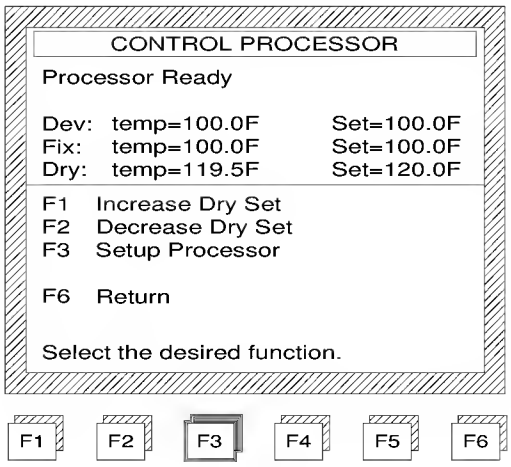
The Processor configuration and setpoints are initially set up as follows:

Replenishment Mode	Automatic
Display Units	°F
Developer Temperature	37.8°C (100°F)
Fixer Temperature (minimum)	37.8°C (100°F)
Automatic Developer Replenishment (35 x 43 cm sheet)	60 mL
Automatic Fixer Replenishment (35 x 43 cm sheet)	85 mL
Flooded Developer Replenishment (35 x 43 cm sheet)	65 mL
Flooded Fixer Replenishment (35 x 43 cm sheet)	65 mL
Dryer Temperature	48.9°C (120°F)

Using the Access Code

Only the Service Representative and the Key Operator should use the access code.

The *access code* **4213** is necessary to change setup information that is preset at the factory (like *default* settings). The *access code* is **not** necessary to change the Dryer temperature. The *access code* must be entered at the Processor Setup Access Screen. Use the Control Processor Screen to enter the Processor Setup Access Screen.



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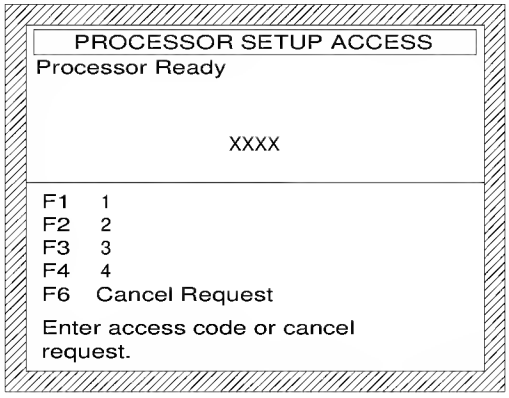
Press [F3] to display the Processor Setup Access Screen. This selection only appears as an *option* on the *screen* when there is no film in the Processor.

Processor Setup Access Screen



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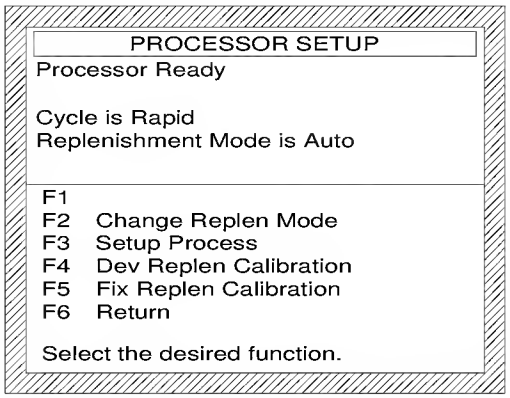
The Control Panel Function keys [F1] through [F4] represent the numbers 1 through 4, respectively, and must be pressed in the order of the *access code*. For each number entered, an X is displayed in the Data Section of the *screen.*

When the *access code* is entered correctly, the Processor Setup Screen is displayed.

If an incorrect *access code* number is entered, any Xs displayed on the *screen* are removed and the *access code* must be completely re-entered.

Press [F6] to cancel the request and return to the previous *screen*.



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Section 12: Mixing Chemistry

Mixing the Chemistry

Warning

Wear protective eyewear when mixing the chemistry.

Important

When mixing chemistry, follow all instructions and precautions that are provided with the chemicals. Mix only a 2-week supply of developer and fixer replenishment.

Following all directions provided with the solutions, mix at least 19 liters (5 gallons) of solution.

Section 13: Setting Up the Processor

Table of Contents

Description	Page
Processor Configuration	2
Automatic Replenishment Mode	2
Flooded Replenishment Mode	2
Tank Fill Mode	2
Disable Replenishment	2
Selecting a Replenishment Mode	3
Procedure	3
Automatic Replenishment Mode	7
Flooded Replenishment Mode	8
Calibrating the Replenishment System	10
Changing Setpoints	14
Standby Mode	18
Display Units	18

Processor Configuration

Automatic Replenishment Mode

Select this mode when you want the Processor to automatically adjust the replenishment volumes for developer and fixer according to the film usage for the Processor. See "Replenishment Mode" in this section.

Flooded Replenishment Mode

Select this mode when the film usage for the Processor is only 1 or 2 sheets of film during a ½ hour period. Chemicals will be replenished automatically:

- every 5 minutes, achieving a minimum replenishment of 780 mL/hour during Processor operation.
- when the equivalent film area of 35 x 43 cm has been processed.

Note

Contact your Service Representative for other Flooded Mode requirements.

Tank Fill Mode

Select this mode to fill the Processor tanks automatically. In this mode the Processor tanks fill with solution from the Replenishment Tanks until the level sensors detect that the Processor Tanks are full.

Disable Replenishment

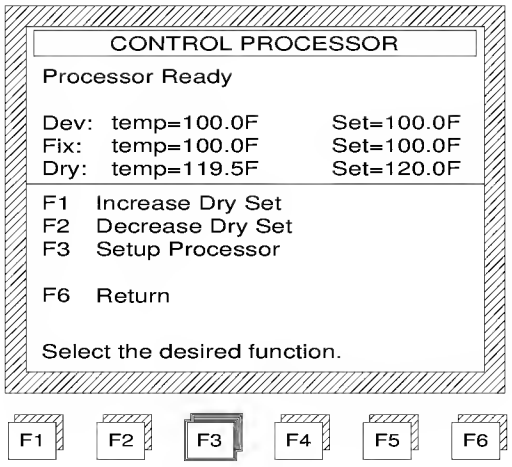
Select this feature to disable the Replenisher Pumps before doing any of the cleaning procedures.

Selecting a Replenishment Mode

Procedure

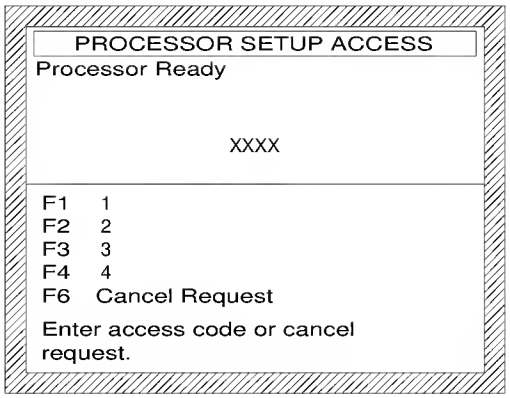
Changes to the replenishment volume will be stored until new changes are made. *Replenishment mode* is *Automatic* or *Flooded*.

[1] To select a replenishment mode, press [F4] at the Other Functions Screen to see the Control Processor Screen.



H126_9049AC

[2] Press [F3] at the Control Processor Screen to display the Processor Setup Access Screen.



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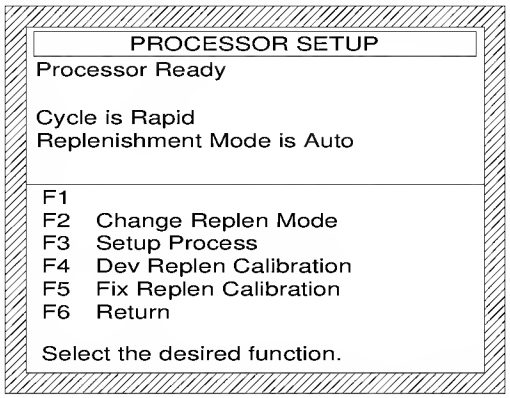
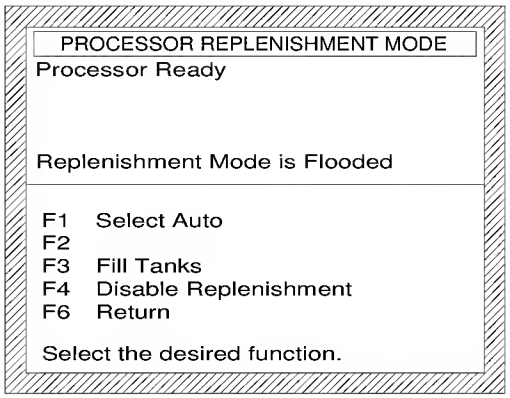
[3] Enter the four-digit *Access Code*.



H126_9051AC

[4] Press [F2] to change the *replenishment mode*.



H126_9052AC

[5] If the *Replenishment Mode* is *Flooded*, and you want to change it to *Auto*, press [F1] to select *Auto Replenishment Mode*. If the *Replenishment Mode* is *Auto* and you want to change it to *Flooded*, press [F2] to select *Flooded Replenishment Mode*.

Automatic Replenishment Mode

This is the standard replenishment mode of the Processor. In this mode, replenishment will occur under 2 conditions:

- The replenishment cycle is activated each time approximately 1500 cm^2 (238 $in.^2$) of film has been processed. This is equivalent to one 35 x 43 cm (14 x 17 in.) sheet of film. The amount of replenisher that is added for each 1500 cm^2 (238 $in.^2$) of processed film can be adjusted by the operator within a certain range. The default amounts are 60 mL of developer and 85 mL of fixer.
- The Processor will replenish to compensate for low film usage. Low-volume applications are those processors that process less than 75 sheets of film in 24 hours (for continuous-run applications) or over 2 power-up cycles (where the last cycle is more than 3.5 hours on the replenishment timer). A low-volume application is further divided, and different replenishment volumes are added accordingly for proper control:

Sheets on Current Film Count	Replenishment Added over 4 Hours
less than 55 sheets	1 L (125 mL/½ hour)
56 - 65 sheets	750 mL (93 mL/½ hour)
66 - 74 sheets	400 mL (50 mL/½ hour)

Note

The Replenishment Pumps will automatically turn on every ½ hour during the 4-hour period when extra replenisher is added. This is the normal operating procedure. Do not be alarmed.

Flooded Replenishment Mode

In the *Flooded Replenishment Mode*, the preset values for developer and fixer replenishment volumes are:

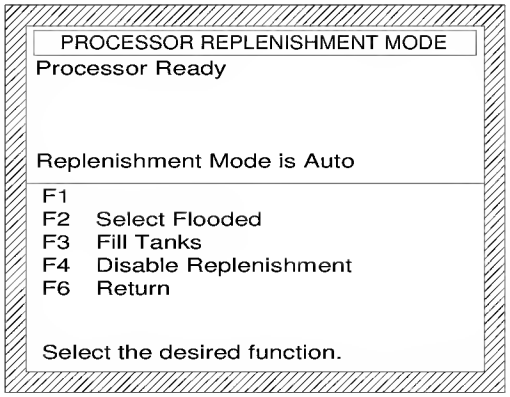
- 65 mL every 5 minutes.
- 65 mL for each 1500 cm^2 (238 $in.^2$) of film.

If you wish, you may change the setup information by using the function keys on the display panel. See "Changing Setpoints" in this section.

Important

Before changing the replenishment volumes, calibrate the replenishment system. See "Calibrating the Replenishment System" in this section.

Press [F2] at the Processor Setup Screen to display the Processor Replenishment Mode Screen.



H126_9053AC

Press [F2] to select the *Flooded Replenishment Mode* when the film usage for the processor is only 1 or 2 sheets of film during a ½ hour period. Replenishment will be added automatically:

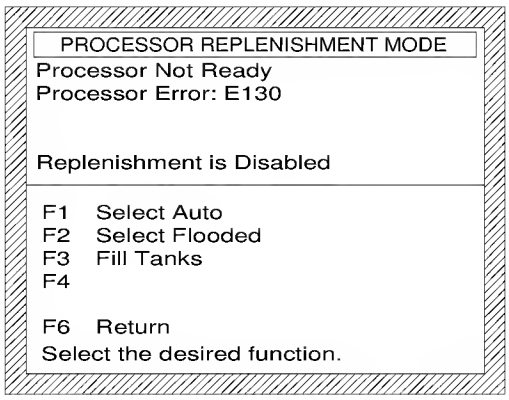
- every 5 minutes, achieving a minimum replenishment of 780 mL/hr during the processor operation.
- when the equivalent film area of 35 x 43 cm has been processed.

Note

Contact your Service Representative for other *Flooded Replenishment Mode* requirements.

Press [F3] to fill the Developer and Fix Tanks. While the Tanks are being filled, the Data Section of the Display Screen displays "Processor Error: E129" (Tanks being filled).

Select [F4] to disable the Replenisher Pumps before doing any of the cleaning procedures. When the Replenishment Pumps are disabled, the Display Screen shows the message, "Processor Error: E130", as illustrated on the *screen* below.



H126_9054AC

Press [F6] to return to the previous *screen*.

Calibrating the Replenishment System

Procedure

Important

Calibrate the replenisher pumps every 3 months.

Calibration of the replenishment system will determine the actual rate of solution flow through the Replenishment Pumps for a given period of time.

Measure the volume of solution that is delivered by the system, then use the Display Panel to enter the measurement into the microprocessor. The microprocessor computes the rate of solution flow through the Pump, then adjusts the period of time that the Pump must operate to deliver the replenishment volume that was set.

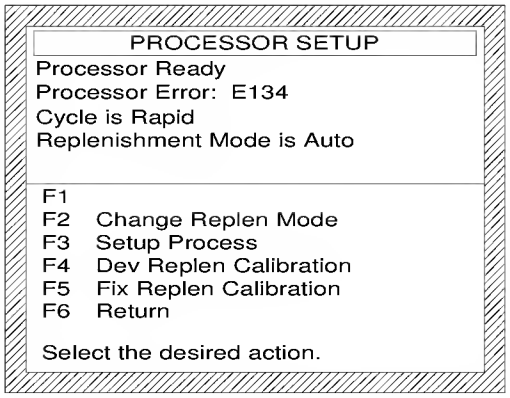
Note

The volume actually measured during this procedure is not the volume that is delivered for a 35 x 43 cm sheet of film during normal equipment operation.

[1] To *calibrate* the replenishment system, press [F4] at the Other Functions Screen to see the Control Processor Screen.

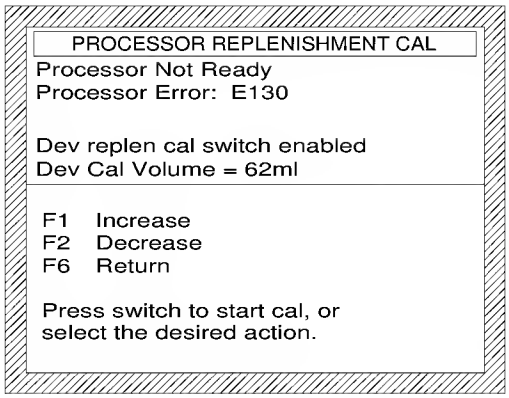
[2] Press [F3] at the Control Processor Screen to display the Processor Setup Access Screen.

[3] Enter the four-digit *Access Code: 4213*.

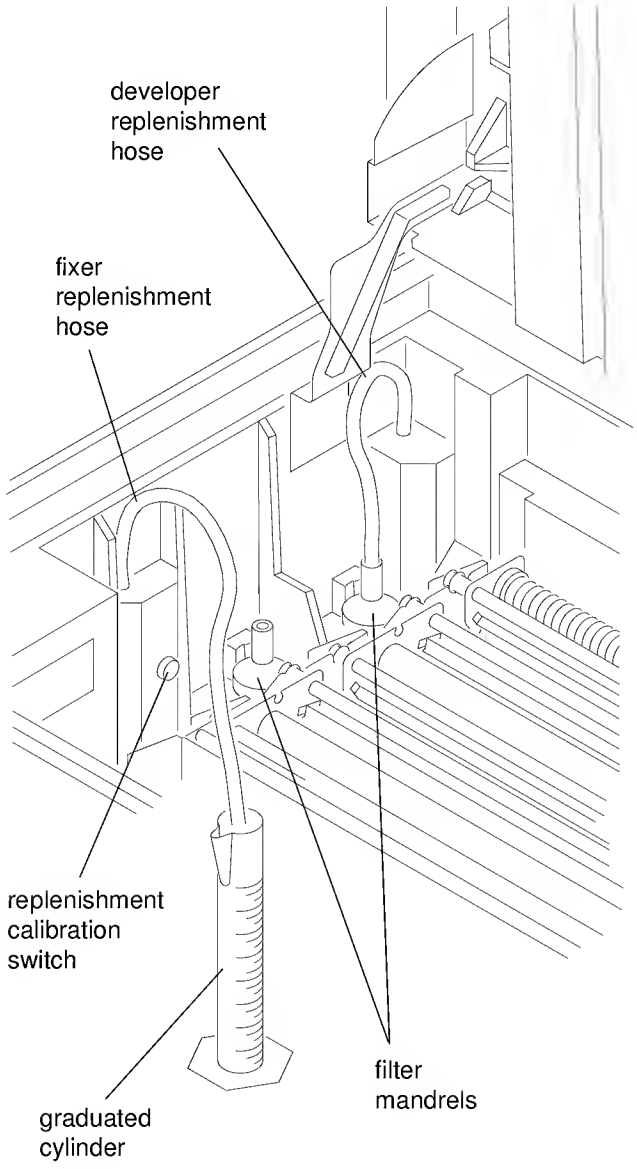


H126_9055AC

[4] Press [F4] to *calibrate* the replenishment of the developer, or press [F5] to *calibrate* the replenishment of the fixer.



H126_9056AC



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H127_0072CA

Warning

Wear protective eyewear when following this procedure. Replenishment solutions are pumped quickly and may splash.

[5] Follow the directions at the bottom of the *screen*. When this *screen* is displayed, the Replenishment Calibration Switch is *enabled* for the procedure that is described below.

[6] Open the Top Cover of the Processor.

[7] Remove the Fixer Replenishment (or Developer Replenisher) Hose and place it into the Graduated Cylinder.

[8] Press the Replenishment Calibration Switch.

[9] Measure and record the volume of replenishment that was released by the system.

[10] Dispose of the solution in the Graduated Cylinder.

[11] Do steps 7 through 10 at least 2 more times.

[12] Determine and record the average volume that was released by the system.

[13] Return the Replenishment Hose into the appropriate filter mandrel. The Fixer Hose goes into the blue Mandrel, and the Developer Hose goes into the red Mandrel.

[14] Close the Top Cover of the Processor.

[15] At the Processor Replenishment Calibration Screen, press [F1] to increase the *calibration* volume or press [F2] to decrease the *calibration* volume until the volume of replenishment displayed equals the average volume you measured in step 12.

For example, if the average volume delivered by the system is 62 and the Display Screen shows "Dev cal volume = 67ml," press [F2] to decrease the volume until "Dev cal volume = 62ml" appears on the *screen*. This will inform the microprocessor of the actual rate of the solution flow. The microprocessor will vary the length of time that the pump operates to get the volume that is required.

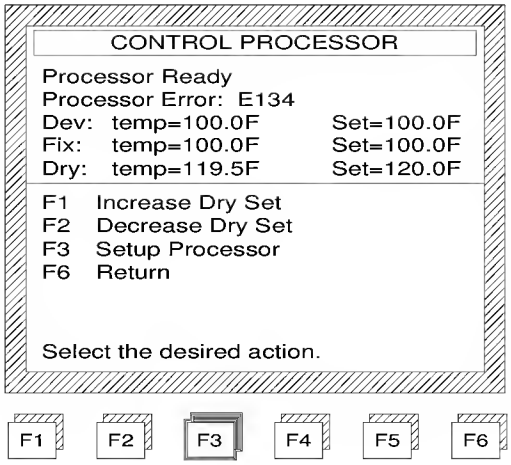
[16] Press the [F6] key to do steps 5 through 15 for the other solution.

[17] Press [F6] again to return to the previous *screen*.

Changing Setpoints

This procedure explains how to change processor variables whose setpoints were preset at the factory. In most cases, factory setpoints will provide optimum film processing.

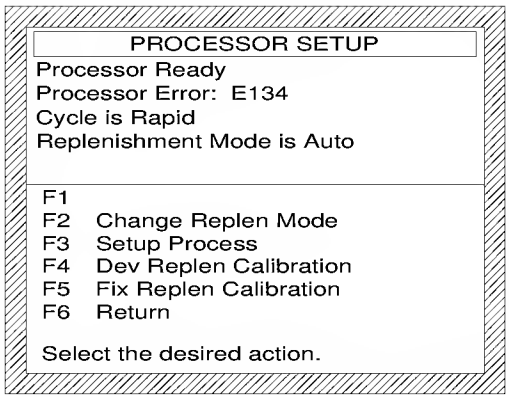
[1] Press [F4] at the Other Functions Screen to see the Control Processor Screen.



H126_9057AC

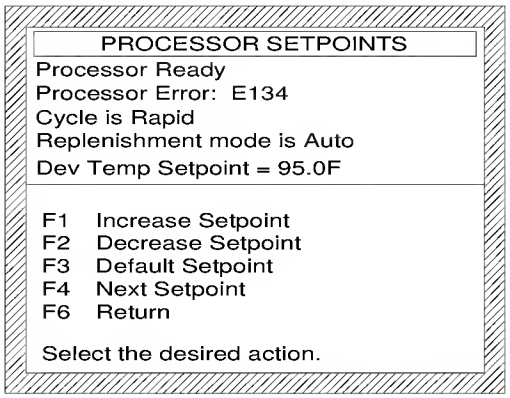
[2] Press [F3] at the Control Processor Screen to display the Processor Setup Access Screen.

[3] Enter the four-digit *Access Code*.



H126_9055AC

[4] Press [F3] at the Processor Setup Screen to display the Processor Setpoints Screen.



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The Data Section of the Display Screen shows the setpoints that will be modified by the [F1], [F2], and [F3] keys. In the above *screen* example, the line shows "Dev Temp Setpoint = 95.0F."

Press [F1] to increase the Processor developer or fixer setpoint in increments of 0.1° Celsius (or 0.1° Fahrenheit), or the replenishment volume in increments of 1 mL.

Press [F2] to decrease the Processor developer or fixer setpoint in increments of 0.1° Celsius (or 0.1° Fahrenheit), or the replenishment volume in increments of 1 mL.

Press [F3] to restore the setpoint to the *default* setting of the Processor.

Press [F4] to change the current processor parameter that is displayed to the next parameter. This parameter can be modified by function keys [F1] through [F3]. The processor setpoints display in the following order:

- developer temperature setpoint
- fixer temperature setpoint
- developer replenishment volume
- fixer replenishment volume

Note

The temperature setpoint for the fixer solution is a minimum setpoint. The temperature may rise above this setpoint.

Press [F6] to return to the previous *screen*.

Standby Mode

If the 180 LP or 180 LPS Processor doesn't receive film for approximately 60 seconds after the last film has exited, the Processor will enter standby mode. When the Processor goes into standby mode, the following events occur:

- the water supply is turned off, unless it is needed to cool the developer.
- the developer is maintained at setpoint temperature. The fixer is maintained at setpoint temperature or higher, since it is not cooled.
- the Dryer Heater and Blower turn on and off at a fixed interval of 45 seconds. The Blower is turned on and the temperature is checked. If necessary, the Heater turns on until the setpoint temperature is reached. Once the proper temperature is reached, the Blower and Heater turn off and stay off for 45 seconds when the cycle is repeated.
- the Drive Motor and water supply will turn on and off every 8 minutes for 1½ minutes to keep the Rollers wet.

The Processor will come out of standby mode and operate when a film is printed and sent to the Processor.

Display Units

When your system is installed and configured, the installer can select the temperature display format for English (°F), or metric (°C) temperature units. If you need to change the display units, contact your Service Representative.

Section 14: Operating Instructions

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Adjusting Dryer Temperature	4
Shutdown	5

Start-Up

Procedure

[1] Turn on the water supply to the Processor.

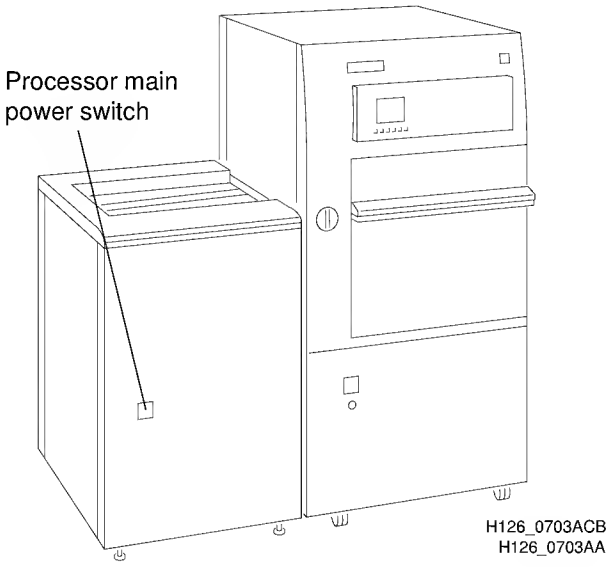
[2] Check that the Processor Cover is closed.

Note

The Replenisher Pumps start automatically when the Processor is turned on.

[3] Turn on the power for the Processor by moving the main wall circuit breaker to the ON position.

[4] Turn on the Processor by moving the Main Power Switch on the Processor to the "I" position. Allow 20 minutes for the Processor to warm up.

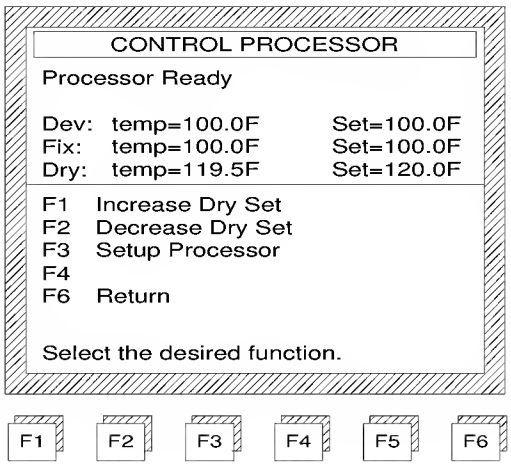


Note

If an *image* is sent to the Printer before the chemistry in the Processor has reached the correct temperature, the *image* will remain in the printer queue until the Processor becomes ready.

Adjusting Dryer Temperature

Procedure



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Press [F1] to increase the dryer setpoint in increments of 1° Fahrenheit (or 1° Celsius).

Press [F2] to decrease the dryer setpoint in increments of 1° Fahrenheit (or 1° Celsius).

Note

It is important that the Dryer temperature be monitored and set to the appropriate temperature. The Dryer temperature should be set to the lowest possible temperature that still allows good film drying quality. But if the Dryer temperature is set too low, it may cause the film to jam. If film seems sticky or damp, increase the temperature.

Shutdown

Procedure

[1] Wait for all films to be printed. You can check the Print Queue Screen or Control Printer Screen on the Printer to make sure that *images* are not being printed, or in the printer queue.

[2] Turn off the Processor by moving the Main Power Switch to the "0" position.

[3] Move the main wall circuit breaker for the Processor to the OFF position.

[4] Turn off the water supply.

[5] Lift the Processor Cover to vent fumes.

Section 15: Preventive Maintenance

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Overview

Reliable operation of the Processor requires that all parts are cleaned and adjusted correctly on a regular basis. The following procedures should be followed to keep your system in good working order.

Weekly

Procedure

The following procedure should be performed every week.

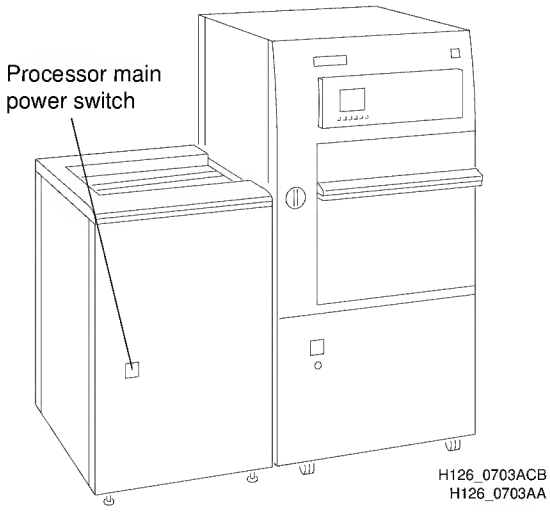
Warning

DANGER. HIGH VOLTAGE.

This equipment is operated with hazardous voltage which can shock, burn, or cause death. Do not try to open the Processor or remove the Panels of the Processor except for the Top Cover. Only a Service Representative may remove the Panels of the Processor.

Follow the shutdown procedure and turn off all electrical power to the Processor before performing preventive maintenance.

[1] Turn off the Processor by moving the Main Power Switch to the "0" position.



[2] Move the main wall circuit breaker for the Processor to the OFF position.

[3] Turn off the water supply.

Warning

Wear rubber gloves, safety glasses, and protective clothing when doing any maintenance on the 180 LP or 180 LPS Processor.

[4] Lift the Top Cover of the Processor.

Caution

Handle all Racks carefully to prevent changing their alignment or causing damage. Do not clean the Racks, Crossover Assembly or Squeegee Rollers with abrasive materials.

[5] Remove the Wet Section Cover, all Crossover Assemblies, and the Wash Rack.

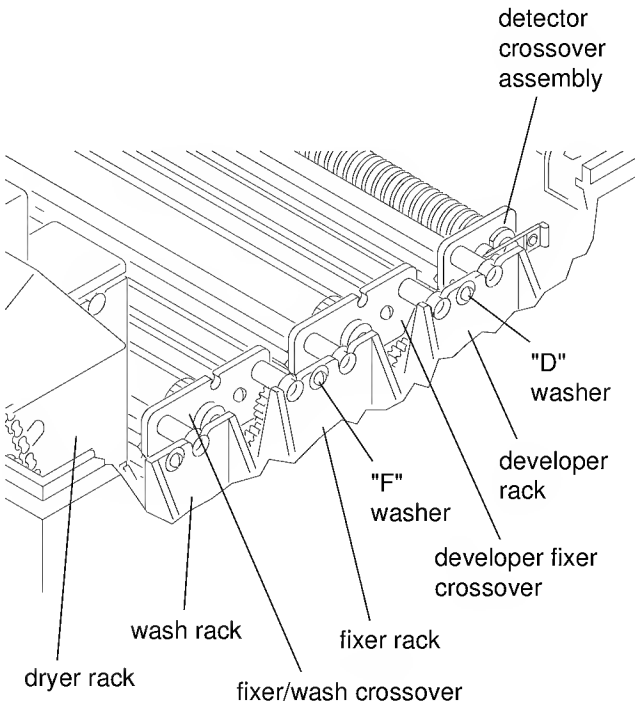
[6] Clean all Crossover Assemblies, the Wash Rack, and the Crossover Rack Guide Shoes by wiping them with a soft, damp cloth and rinsing them with clean, warm water.

[7] Clean the Detector Crossover Assembly with a soft fiber brush and warm water. Allow the Detector Crossover Assembly to air dry before processing film.

[8] Check that all Rollers on the Wash Rack and the Crossover Assemblies rotate freely.

[9] Check that the Wash Rack and Crossover Assemblies are square by doing the following:

- Place the Rack or Crossover Assembly on a smooth, flat surface.
- If the Rack or Crossover Assembly is not level with the flat surface, press down to make it level.
- Check the squareness of the Side Plates.
- If the Assembly still is not square, call your Service Representative and ask that the proper adjustments be made.



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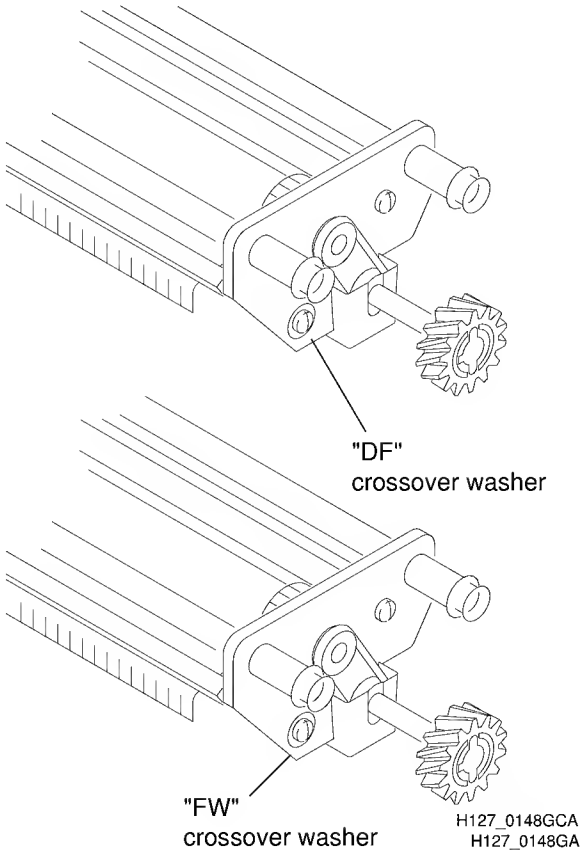
H127_0147GA



[10] Install the Wash Rack, Crossover Assemblies, and Wet Section Cover in the correct positions in the Processor, and check that each Assembly seats firmly. Looking closely at the following illustrations and the front ends of the Racks, you will notice that there are letters on the Washers. The letters are "D" for the Developer Rack, "DF" for the Developer/Fixer Crossover, "F" for the Fixer Rack, and "FW" for the Fixer/Wash Crossover.

[11] Wipe off any chemical deposits in the processing section.

[12] After all Racks have been cleaned and returned to their proper positions in the Processor, move the main wall circuit breaker for the Processor to the ON position.

[13] Turn on the Processor by moving the Main Power Switch to the "I" position.

Note

The Replenisher Pumps start automatically when the Processor is turned on.

Important

If the developer and fixer tanks of the processor need to be emptied and refilled with fresh chemicals, call your service representative.

Monthly

Procedure

In addition to the preventive maintenance procedure that should be followed every week, the following procedure should be performed every month.

Follow the shutdown procedure and turn off all electrical power to the Processor before performing preventive maintenance.

[1] Turn off the Processor by moving the Main Power Switch to the "0" position.

[2] Move the main wall circuit breaker for the Processor to the OFF position.

[3] Turn off the water supply.

Warning

Wear rubber gloves, safety glasses, and protective clothing when doing any maintenance on the 180 LP or 180 LPS Processor.

[4] Lift the Top Cover of the Processor.

Caution

To prevent contamination of the developer and fixer solutions when removing the Fixer Rack, place the Splash Guard between the Developer and Fixer Tanks. Use the Rack Drip Tray for removal or installation of the Racks.

Caution

Handle all Racks carefully to prevent changing their alignment or causing damage. Do not clean the Racks, Crossover Assembly or Squeegee Rollers with abrasive materials.

[5] Remove the Wet Section Cover, all Crossover Assemblies, and all Racks.

Note

Wipe all Rollers in the Dryer Rack using a clean, damp cloth. Check that the Dryer Tubes are installed in the correct position. See the illustration that is located on the Cover of the Dryer Rack.

[6] Check that the slots in the Dryer Air Tubes are clean and in the correct position. If necessary, clean the Dryer Air Tubes with a bottle brush and then rinse them in water.

[7] Clean all Crossover Assemblies, Racks, and the Crossover Rack Guide Shoes by wiping with a soft, damp cloth and rinsing with clean, warm water.

[8] Clean the Detector Crossover Assembly with a soft fiber brush and warm water. Allow the Detector Crossover Assembly to air dry before processing film.

[9] Check that all Rollers on all Racks rotate freely.

[10] Check to be sure that the Racks and Crossover Assemblies are square by doing the following procedure.

a. Place the Rack or Crossover Assembly on a smooth, flat surface.

b. If the Rack or Crossover Assembly is not level with the flat surface, press down to make it level.

c. Check the squareness of the Side Plates.

d. If the Assembly still doesn't seem to be square, call your Service Representative and ask that the proper adjustments be made.

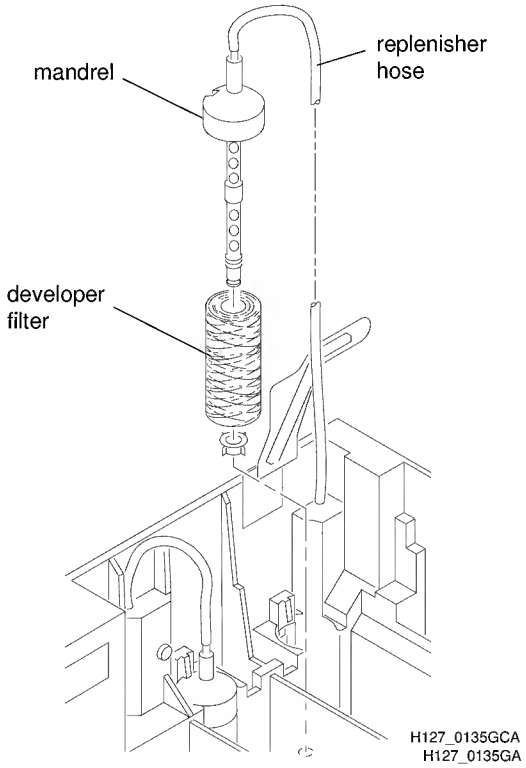
[11] Install the Racks, Crossover Assemblies, and Wet Section Cover in the correct positions in the Processor as described and illustrated in "Weekly" in this section, and check that each Assembly seats firmly.

[12] Every 3 months *calibrate* the Replenisher Pumps. See "Calibrating the Replenishment System" in Section 13.

[13] Check the Replenisher Strainers which are located between the Replenishment Tanks and the Pumps, and clean the Strainers if necessary.

[14] Check the Water Supply Filter. Change the Filter if necessary.

Figure 15–1 **Removal of the Developer Filter**



[15] Change the Developer Filter each month. Follow these steps to change the Developer Filter.

(a) Check that all electrical power to the Processor is OFF.

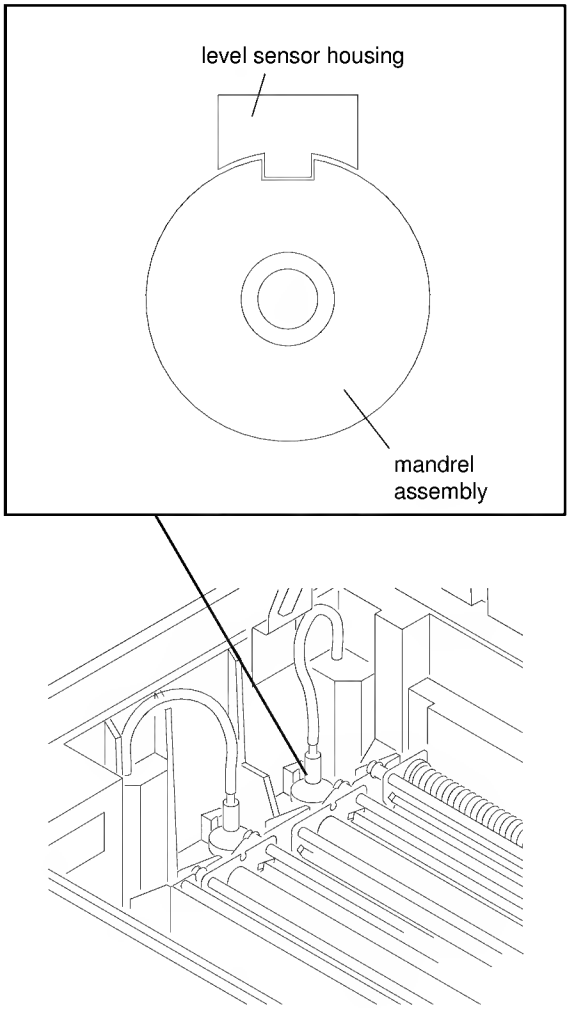
(b) Lift the Top Cover of the Processor.

(c) Remove the Wet Section Cover, and the Replenisher Hose from the Mandrel Assembly as illustrated.

Note

When removing the Mandrel Assembly, place a Drip Tray under it to prevent contamination of the fixer.

(d) Rotate the Mandrel Assembly so that the notch in the top of the Mandrel Assembly is aligned with the clip on the Level Sensor Housing.



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(e) Press the clip on the Level Sensor Housing and remove the Mandrel Assembly by pulling straight up.

(f) Remove the Wing Nut from the Mandrel Assembly and the Developer Filter from the Mandrel Assembly.

(g) Reverse the procedure to install the new Developer Filter.

Note

Contact your Service Representative for the 3 Month Preventive Maintenance Procedures.

Section 16: Using a 21-Step Gray Scale for Processor Quality Assurance

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Overview

The *Kodak Ektascan* 2180 Laser Printer can print a 21-step gray scale. This gray scale can be used with the *Kodak* Process Control Densitometer. The 21-step gray scale can also be used for manual quality assurance checks of the Processor. In most cases, the Processor will be a *Kodak X-Omat* 180 LP or 180 LPS docked to the 2180 Laser Printer.

Printing the 21-Step Gray Scale

Important

The 21-step gray scale is used only for processor quality assurance. Do not attempt to calibrate the Printer with this test pattern.

The 21-step gray scale can be printed on film by selecting "Calibration" from the "Print Test Films" menu. To access this menu, do the following steps.

[1] Access the Control Printer menu.

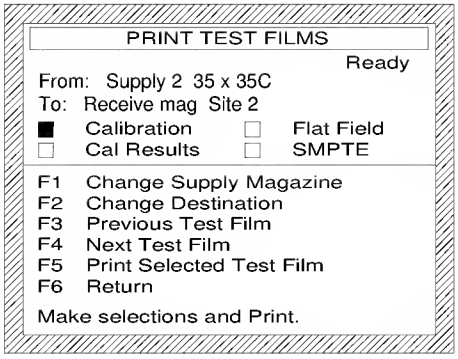
[2] Press [F4] to show Other Functions.

[3] Press [F5] to Show More Functions.

[4] Press [F4] to access the Print Test Films menu.

[5] From the displayed menu, highlight the box corresponding to the "Calibration" test film.

[6] Press [F5] to print the selected test film.



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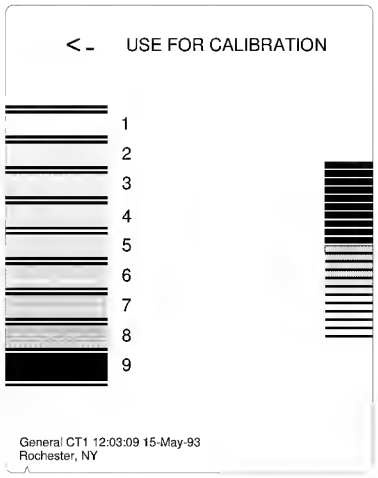
The following illustration represents the test pattern film showing the 21-step gray scale on the right side of the film.



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Setting Up the *Kodak* Process Control Densitometer

For complete instructions on setting up the *Kodak* Process Control Densitometer, refer to the Operation Manual for the *Kodak* Process Control Densitometer, Publication Part Number 635933, available from X-Rite (616) 534-7663.

Note

The *Densitometer* has 16 channels. Each channel monitors a single processor. Therefore, it is necessary to dedicate and set up a channel for each processor in your department.

There are 4 parameters which should be monitored:

- Speed Index (S Index)
- Base+Fog (B+Fog)
- Customer Upper Density Point (CUDP)
- Developer Temperature (Temp °F)

Note

Contrast Index (C.Indx) does not need to be monitored.

It is recommended that the factory preset *Densitometer* value of "Dmax" be changed to CUDP value to more accurately describe the variable monitored. For more information, refer to the section "Determining the Customer Upper Density Point" on page 16–8.

Entering Density Data into the *Kodak* Process Control Densitometer

[1] Use [↑] and [↓] to select the channel for storing the processor monitoring values.

[2] Orient the 21-step gray scale pattern film, with its emulsion side down, for insertion into the *Densitometer* as illustrated.

[3] Position the film against the **Stop** of the *Densitometer*. Insert the film until it rests against the Drive Rollers and the Motor is activated.

[4] While the film density is measured, gently hold the film against the **Stop**, guiding the film to prevent skewing.

[5] Press [go]. The date and time are momentarily displayed.

[6] Use [↑] and [↓] to enter the temperature of the developer solution.

[7] Press [go] to store the data and advance to the next step.

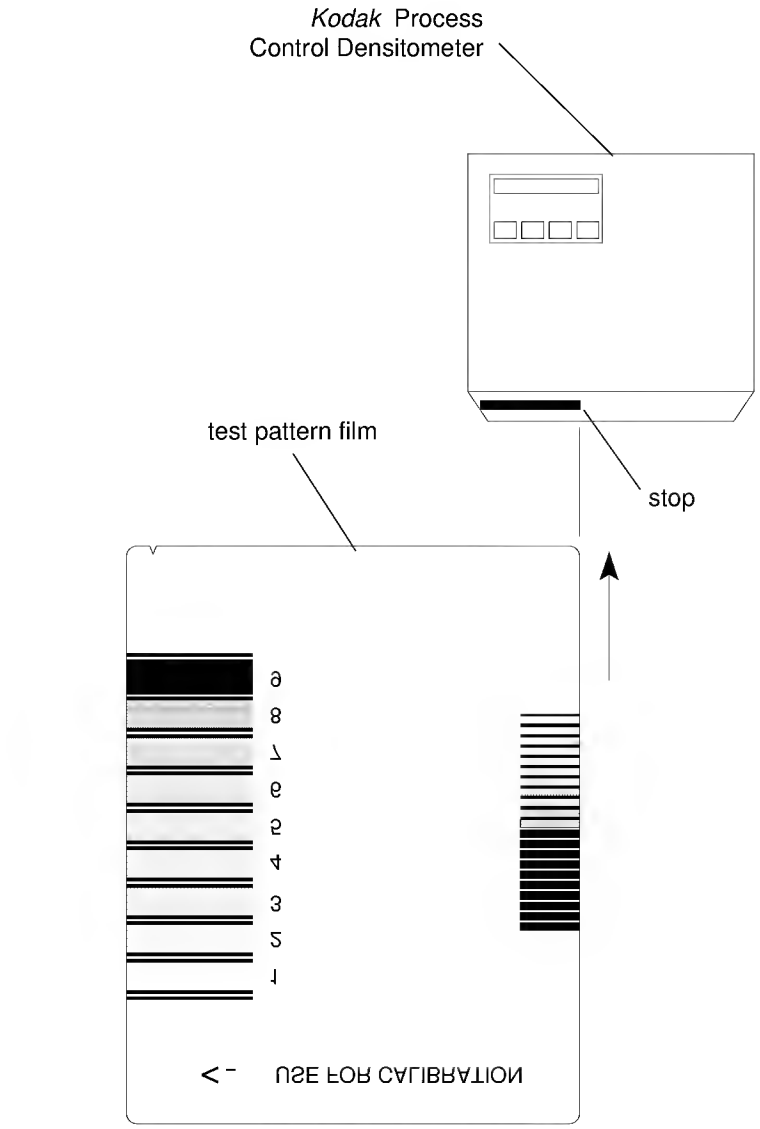
[8] Press [meas.] to view the calculated parameters and density values measured on the 21-step gray scale, or press [dev.] to view the data as deviated from the reference values.

[9] Press [p1] through [p4] to view the measured data.

[10] Press both "Menu" keys to exit the main menu.

Note

If the *Densitometer* is connected to an appropriate Printer, the data can be sent to the Printer. Refer to Section 3.3 of the Operation Manual for the *Kodak* Process Control Densitometer, Publication Part Number 635933, for further information on sending data.

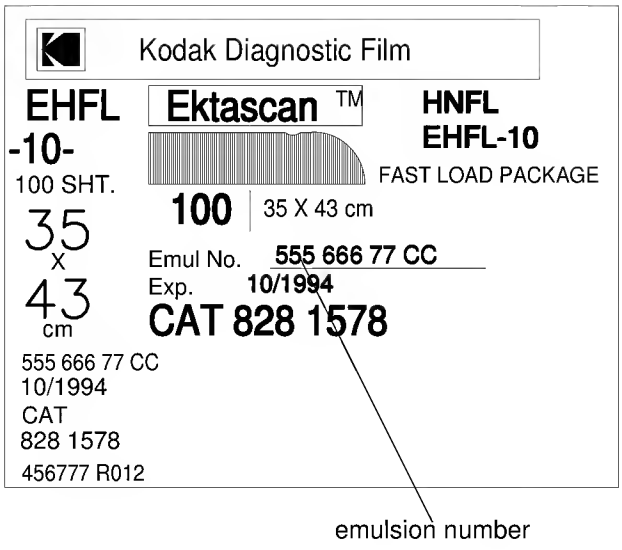


H126_0031CCA
H126_0031CA

Items Needed for Processor Quality Assurance

The following items are needed for processor quality assurance:

- *Kodak* Process Control Densitometer, or alternative densitometer
- Thermometer (**not** mercury)
- Control charts for recording process control data or *Kodak* Process Control Densitometer with an appropriate printer
- Fresh box of *Kodak Ektascan* HN Laser Film
  The laser film that is routinely used in the Printer can be used, but the emulsion number must be tracked. The emulsion number is identified on the box of film as indicated below.



H126_2718GCA
H126_2718GC

Establishing the Baseline

[1] Check the following:

- The Processor is thoroughly cleaned and functioning correctly.
- The Processor is filled with correctly mixed fresh chemicals.
- The correct developer temperature and replenishment rates have been set.

[2] Set aside a fresh box of *Kodak Ektascan* HN Laser Film. Designate it as the Quality Control ("QC") film and record the emulsion number.

Note

If the film used in the 2180 Laser Printer is used as the "QC" film, then the emulsion number must be tracked. Each time the emulsion number changes, it will be necessary to perform a crossover procedure. This procedure is defined on page 16–10.

[3] Calibrate the Printer using the normal procedure.

[4] On 5 consecutive days, expose the "QC" film using the 21-step gray scale test pattern as described on page 16–2.

[5] After the 5 strips have been exposed and processed, use a Densitometer to read the density steps on each strip by taking the density readings from the middle of each of the 21-steps.

[6] Average the density values of the 21-steps for the 5 strips.

Note

For users of the *Kodak* Process Control Densitometer, the reference values for the Processor can be entered automatically. Refer to the "Automatic Reference Entry" section in the Operation Manual for the *Kodak* Process Control Densitometer (Publication Part Number 635933).

Determining the Speed Index

[1] Determine which gray scale step has an average density closest to 1.20. Designate this step as the Speed Index for all future Speed Index determinations.

[2] Record the step number on the control chart.

[3] Record the average Speed Index value on the control chart.

Determining the Base+Fog Value

[1] Use the 5 day average of gray scale step number 1 (the least exposed step) for the Base+Fog value.

[2] Record the average Base+Fog value on the control chart.

Determining the Customer Upper Density Point

[1] Determine which gray scale step has an average density closest to 2.90. Designate this step as the Customer Upper Density Point (CUDP) for all future CUDP determinations.

[2] Record the step number on the control chart.

[3] Record the average CUDP value on the control chart.

Note

For users of the *Kodak* Process Control Densitometer, it is recommended that the preset value of "Dmax" be changed to the CUDP value to more accurately describe the variable being monitored. Refer to the "Field Editor" section in the Operation Manual, Publication Part Number 635933, to change the field name and enter the step number (closest to 2.90 in value) referencing the CUDP.

Developer Temperature

[1] Record the developer temperature recommended by the film manufacturer for your:

- type of film
- developer (chemicals)
- Processor
- length of developer immersion time

[2] Record this value on the control chart.

Establishing Operating Limits

[1] The operating limits for the following processor variables are ±0.15:

- Speed Index
- Customer Upper Density Point

[2] The operating limit for Base+Fog is +0.03. (There is no lower limit for Base+Fog.)

Daily Processor Quality Assurance

[1] Expose and process a sensitometric strip each morning.

[2] Use a Densitometer to read the values for the following processor variables, using the same gray scale step numbers recorded on the control chart:

- Speed Index
- Customer Upper Density Point
- Base+Fog

[3] Plot the values and the measured temperature on the control chart.

[4] Evaluate the results and make the necessary adjustments before processing any film.

Evaluating the Control Chart

[1] Differences of less than 0.15 should be considered to be normal process variations.

[2] Differences greater than 0.15 require immediate attention.

[3] Differences greater than 0.03 for Base+Fog require immediate attention.

[4] If any points on the control chart reach or exceed the limits, expose and process another sensitometric strip for comparison. If the same results occur, determine and correct the cause.

[5] A trend exists if a series of consecutive points (3 or more) progress steadily upward or downward. Such a trend may be a shift taking place slowly and visibly with respect to time. Monitor the Processor closely.

[6] Trends or gross fluctuations should be noted and evaluated. Take appropriate action as necessary.

[7] Record the reasons for fluctuations, such as:

- routine preventive maintenance
- fresh chemicals
- developer starter added

Crossover Procedure

[1] Perform a crossover procedure when the new *Kodak Ektascan* HN Laser Film used has an emulsion number different from that of the previously used "QC" film.

[2] On the same day, at the same time, expose the 21-step gray scale and process 5 films from the existing box of "QC" film and 5 films from the box with the new emulsion number.

[3] Using the same gray scale step numbers, determine the average values for the 2 groups of film for:

- Speed Index
- Customer Upper Density Point
- Base+Fog

[4] Record the average values from the new box of "QC" film on the control chart.

[5] Record the new emulsion number.

Final Comments

[1] It is recommended that a maintenance log be kept for the Processor and 2180 Laser Printer to record all service on the units. This log can be used to correlate system service with system performance.

[2] The calibration of the Densitometer and thermometer should be checked periodically according to the recommendations of the manufacturer, when available.

Section 17: *Kodak X-Omat* 180 LP or 180 LPS Sorter Kit

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Using the Control Panel	4
Clearing Film Jams	8
Sorter Error Messages Displayed on the Display Screen of the Laser Printer	12

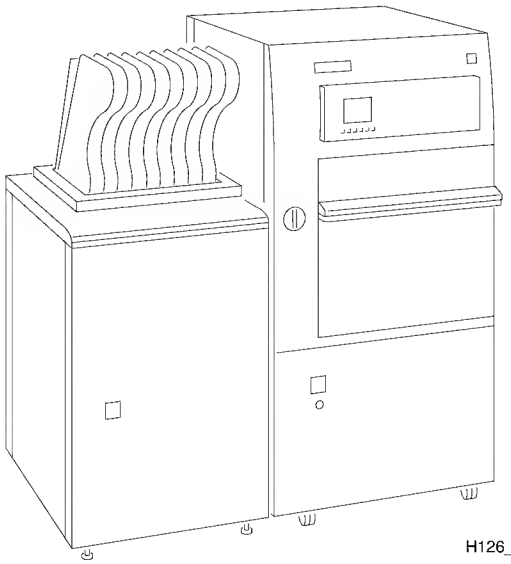
Introduction

General Information

The *Kodak X-Omat* 180 LP or 180 LPS Sorter Kit is installed onto an existing *Kodak X-Omat* 180 LP or 180 LPS Processor. The *Kodak X-Omat* 180 LPS Processor is a Processor that has the *Sorter* installed at the factory. The *Sorter* has 9 *Bins* with a capacity to hold 50 films each and accepts all film sizes, including mixed film sizes.

Each *Bin* is identified with a number and a customer-written label naming the *imaging device* assigned to it. Assignment of *Bins* is done at the Assign Processor Sorter Bins Screen on the Printer by the operator or automatically by the Laser Printer.

Films are stacked in each *Bin* in the order they are printed.



H126_0730AA

The operator can sort by *Bin* or by *Study*. Sort by *Bin* allows the operator to assign a separate *Bin* for each imaging device. Sort by *Study* allows the operator to assign a separate *Bin* for each *Study*.

Note

In order to sort by *Study*, the keypad must be set up for *Study* Mode. See page 4–25.

Do not allow more than 50 films to accumulate in a *Bin*. Overfilling the *Bins* causes the films to jam in the Sorter film path.

Assign more than one *Bin* to any *imaging device* that will accumulate more than 50 films at one time. If it is not possible to assign multiple *Bins*, retrieve the films before the *Bin* collects more than 50 films.

The Printer will automatically assign the unassigned *Bin* with the lowest number to a source when it prints a *study* for that source if the source is not assigned a *Bin* by the operator.

Using the Control Panel

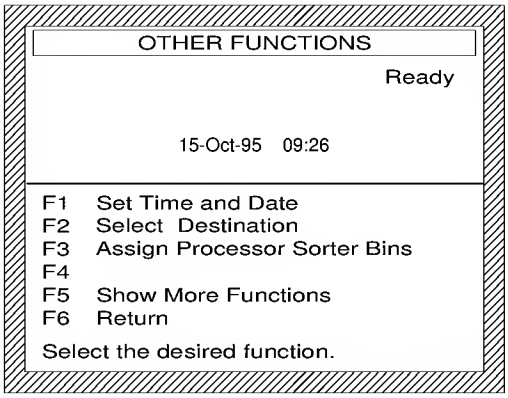
To assign Processor Sorter Bins:

[1] Select [F4] Other Functions at the Control Printer screen.

[2] Select [F5] to Show More Functions.

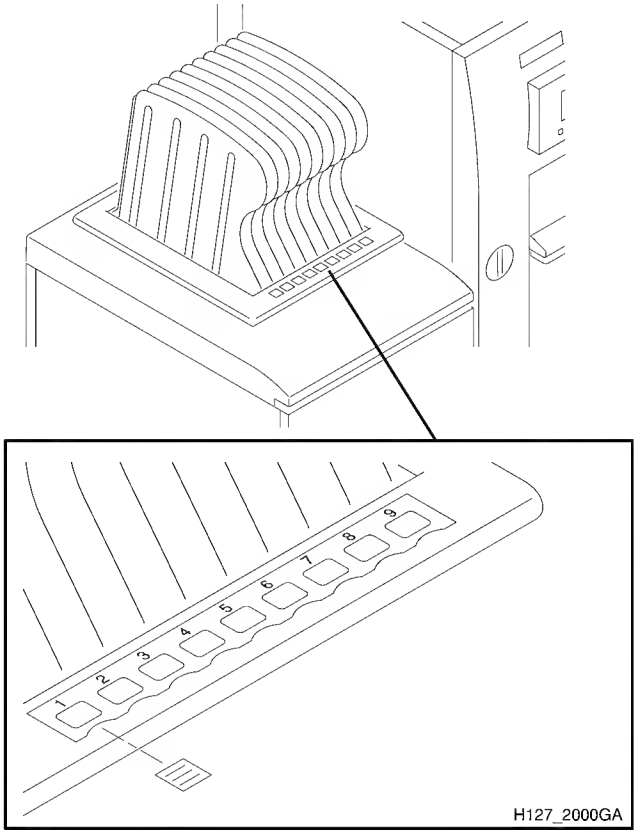
[3] Select [F5] again to Show More Functions. This will access the Other Functions screen.

[4] Select [F3] to Assign Processor Sorter Bins.



H126_9037AC

Assign each Bin to the *imaging device* that you select and write the name of the *imaging device* on the paper insert on the front of the Bin.

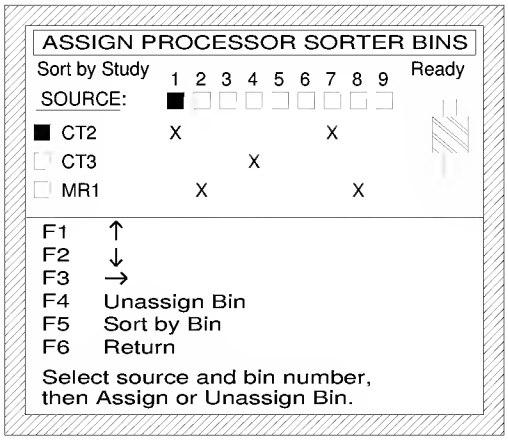


Select [F3] from the Other Functions screen to access the Assign Processor Sorter Bins screen. You can assign as many sources to the same Bin as you want. If no source name is assigned, the system will name the source "~~~~~". If a source is assigned multiple Bins, the first 50 films from that source will be sent to the first Bin and then the next 50 films from that source will be directed to the next assigned Bin. This process will continue with 50 films directed to each assigned Bin from that source.

There is no limit to the number of Bins assigned for each source. If a Bin is full and no other Bin is assigned, empty the Bin so that a film jam will not occur. Bin capacity is 50 films.

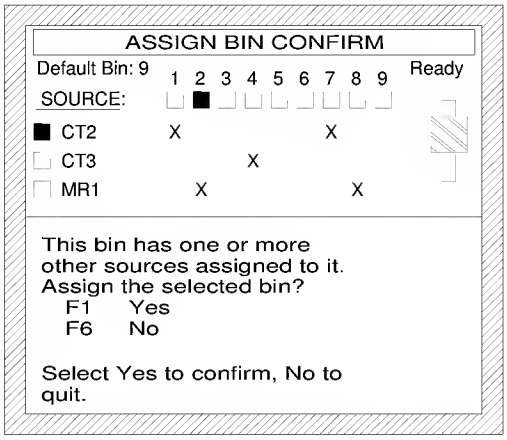
An "X" below the bin number indicates that the Bin is assigned for the source listed. To assign or unassign a Bin to a source, use:

- [F1] and/or [F2] to highlight the selection box of the desired source.
- [F3] to highlight the selection box of the desired Bin.
- [F4] to prompt you to unassign the Bin if there is an "X" for the selected source and Bin pair. If the space below the selected Bin and to the right of the selected source is blank, [F4] will prompt you to assign the Bin.
- [F5] to select "Sort by Study" or "Sort by Bin".



H126_9108AC

The Assign Bin Confirm screen will appear if a Bin has already been assigned to a source. You have the option to make the Bin assignment or not.



H126_9109AC

Clearing Film Jams

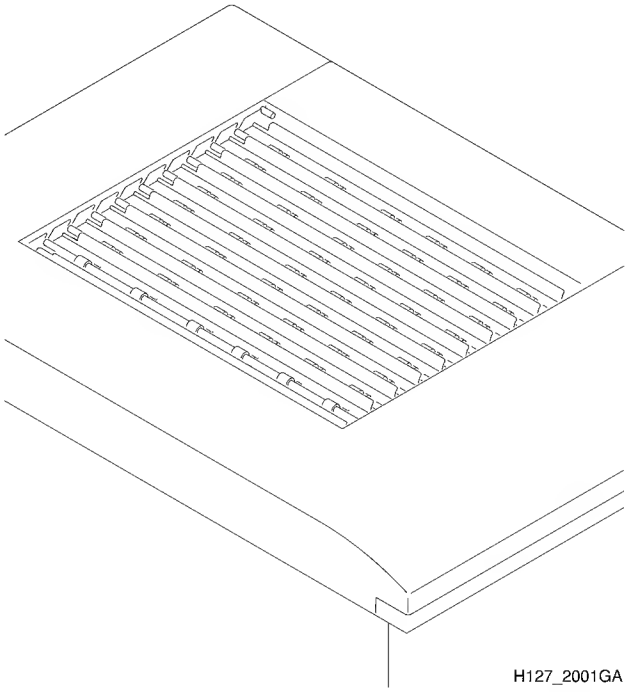
Important

Do not place the Bin Assembly on top of the Laser Printer.

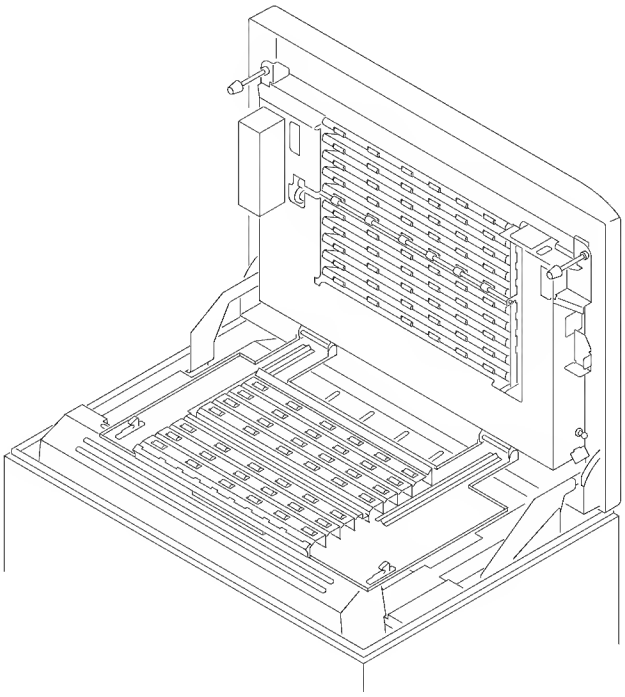
To clear a film jam:

- Remove any films in the Bin and then lift the Bin Assembly from the Processor.
- If a film is protruding from the Sorter mechanism, pull up on the film to remove it.
- If there is no film in that location, open the Processor Cover and then open the Access Door on the bottom of the Sorter mechanism. Remove any films.

The following illustration shows the top of the 180 LPS Processor with the Bins removed.

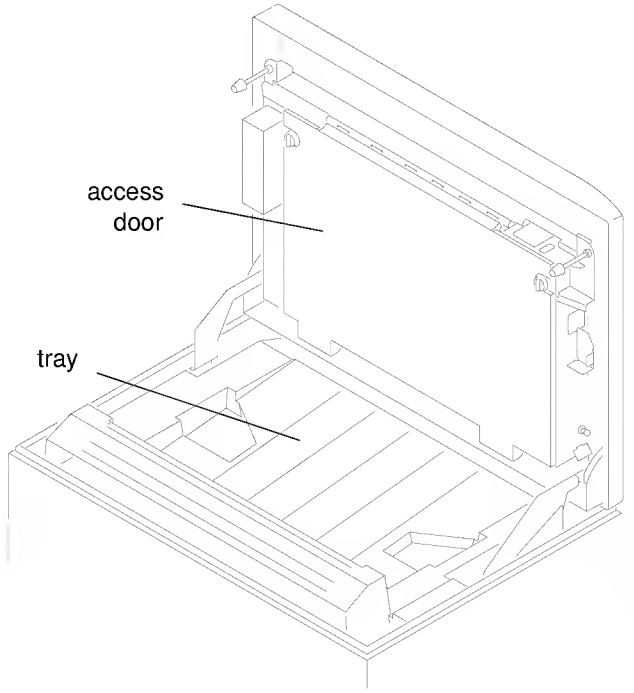


The following illustration shows the bottom of the Sorter mechanism with the Access Door open.



H127_2002GA

The following illustration shows the Processor Cover opened to allow films to transport to the Tray.



H127_2003GCA
H127_2003GA

If the film cannot be cleared, call your Service Representative. The Processor can still operate with the Processor Cover open, allowing films to go into the Tray and bypassing the Sorter.

Sorter Error Messages Displayed on the Display Screen of the Laser Printer

E080	Sorter Bin Ay Not Sensed Replace/reseat processor sorter bin assembly or open processor cover to use film bypass tray.
E081	Film Bypass Tray Not Sensed Replace/reseat processor film bypass tray or close processor cover and install bin assembly.
E082	Processor Speed Error If error repeats, select receive magazine. Call processor service.
E083	Sorter Speed Error If error repeats, remove films and bin assembly. Open processor cover. Use bypass tray.
E09X	Sorting Error At Bin X Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E10X	Sorter Film Jam At Bin X Remove jammed film. If error repeats, call processor service
E11X	Mis-Sorted Film at Bin X Verify correct films in this bin. If error repeats, remove bin assembly and run to bypass tray.
E182	Processor/Sorter Error Film may be jammed in sorter or in processor exit rollers. Call processor service
E183	Processor/Sorter Error Film may be jammed in sorter or in processor exit rollers. Call processor service.
W184	Processor Sorting Warning Film may arrive at wrong bin. Processing will continue. If error repeats, call service.

Section 18: Appendix

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Appendix A - Setting Up Supply Magazines

Overview

There are two film types (blue base and clear base), and four film sizes (8 x 10 inch, 11 x 14 inch, 35 x 35 cm, and 35 x 43 cm) for the 2180 Laser Printer.

A different Supply Magazine setup is required for each film size and type. The Supply Magazines are set up at the factory for 35 x 43 cm (14 x 17 inch) film. If a Supply Magazine needs to be changed, it can be changed by the Service Representative at the customer's site.

When changing film size or type, there are 3 adjustments that need to be made to the Supply Magazine:

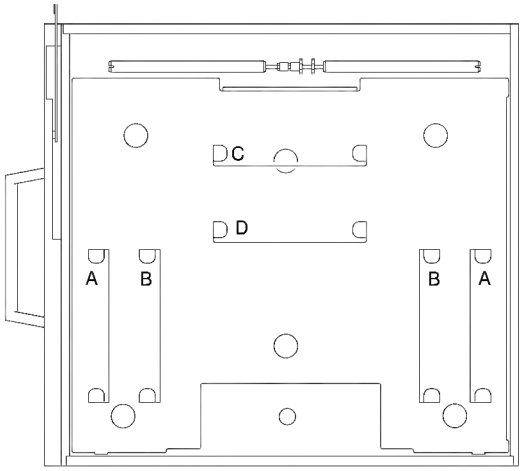
- change the Film Guides
- change the Rear Film Stop Assemblies
- change the Encoding Screws

Changing Film Guides

To change the Supply Magazine Film Guides for different film sizes, you will need a *Torx* T10 driver.

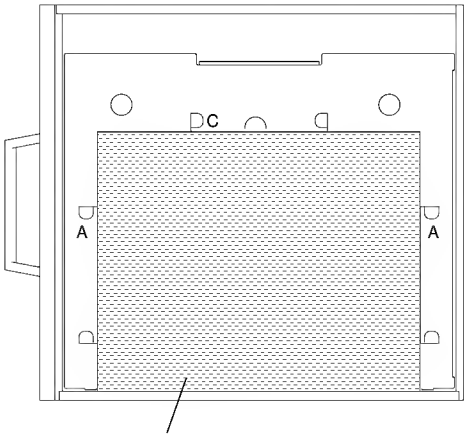
- For 11 x 14 inch film, insert Guides in locations, A, A, and C of the Supply Magazine. Remove the Film Guides from any other locations in the Supply Magazine.
- For 8 x 10 inch film, insert the Guides in locations B, B, and D of the Supply Magazine.
- For 35 x 35 cm (14 x 14 inch) film, insert the Guides in locations A and A only.
- For 35 x 43 cm (14 x 17 inch) film, remove all Guides from the Supply Magazine.

The following illustration shows the different Guide locations for the Supply Magazine.



H126_6335AA

For 11 x 14 inch film, the Supply Magazine Film Guides should be set up in locations A, A, and C as illustrated below.



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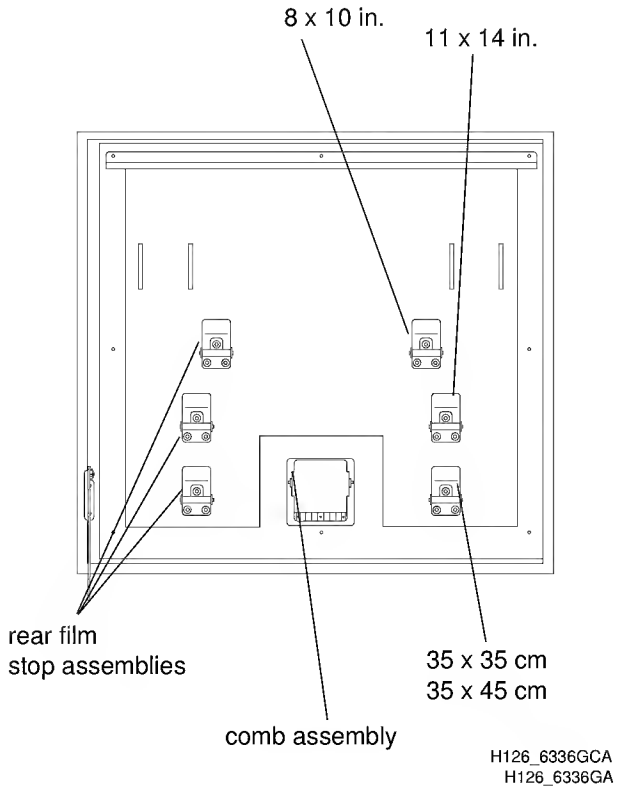
H126_6330AA

Changing the Rear Film Stop Assemblies

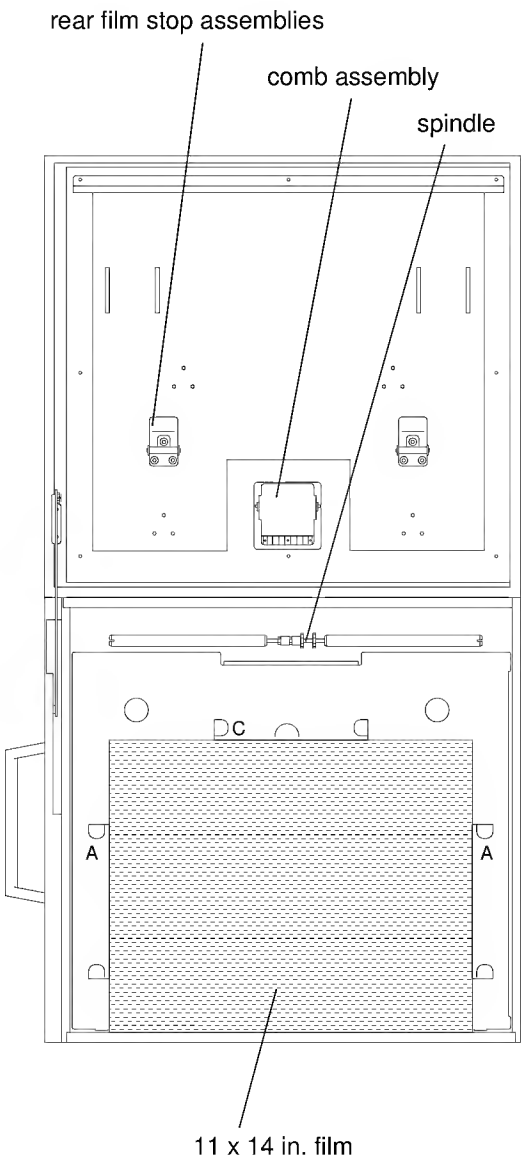
In the Lid of the Supply Magazine, there is a pair of Rear Film Stop Assemblies that keeps the film in place within the Magazine. This pair of Assemblies must be located in the appropriate location for the size of film that is used. The following illustration shows all of the different possible locations for the Rear Film Stop Assemblies in the Lid of the Supply Magazine.

Also located in the Lid of the Supply Magazine is a Comb Assembly which lines up with the teeth on the Spindle to pull the film package from the film. The location of the Comb Assembly does not change.

To change the location of the Rear Film Stop Assemblies, you will need a *Torx* T10 driver.



For the 11 x 14 inch film that we used in the previous example, the Rear Film Stop Assemblies should be set up in the middle locations as illustrated below.



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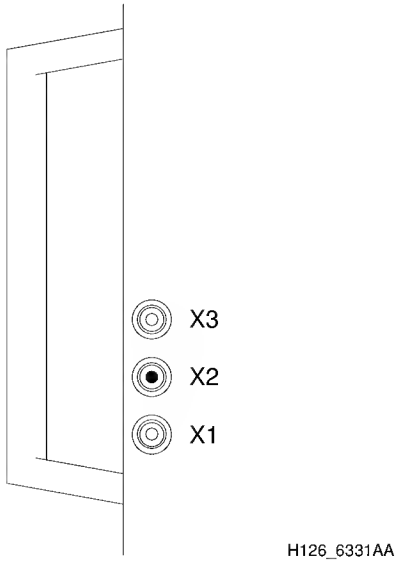
H126_6347CA

Changing the Encoding Screws

To change the Supply Magazine Encoding Screws, you will need a 2.5 mm Hex head wrench.

On the bottom of the Supply Magazine, there are Encoding Screws which are sensed by Switches to communicate information about the film type to the Printer. With the Magazine upside down and the Handle to the left, locate Encoding Screws X1, X2 and X3 as illustrated below.



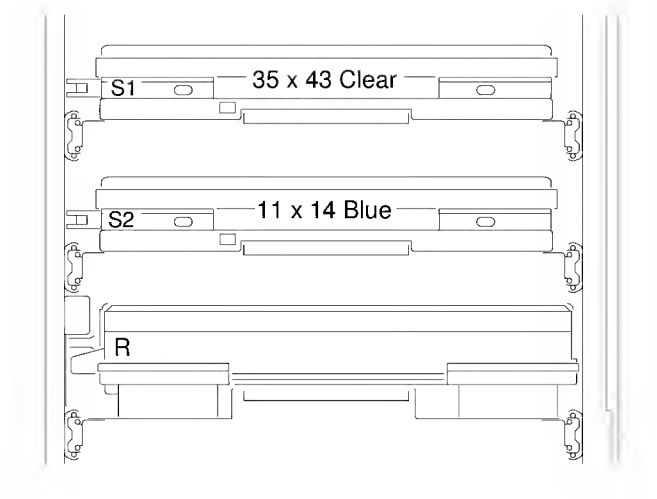
The positions of Screws X1 and X2 define film size. The position of Screw X3 defines the film base type.

Note that in the above illustration, there is a Screw in X2 but not in X1 or X3, indicating that this Supply Magazine is set up for 11 x 14 in. blue base film.

Film size	X1	X2
8 x 10 in.	screw	screw
11 x 14 in.	no screw	screw
35 x 35 cm	screw	no screw
35 x 43 cm	no screw	no screw

Film base	X3
Clear	screw
Blue	no screw

After the Supply Magazine has been set up for the appropriate film type, you should apply an identifying label to the center of the front of the Supply Magazine as shown in the illustration below. Adhesive labels are supplied with each Supply Magazine.



H126_0727AA

Load the new film into the Supply Magazine as described in Part I, Section 3 of this manual.

Ordering Information for KODAK EKTASCAN Laser Imaging Film

The *Kodak Ektascan* 2180 Laser Printer uses *Kodak Ektascan* HN or HNC film. Designed exclusively for helium neon and visible light solid state *laser* imaging, it is available in the following configurations.

Table 18–1 KODAK EKTASCAN Laser Imaging Film in 5 Boxes of 100-Sheet Packages

Size	HN Film CAT No.	
	Blue Base Roomlight EHN-10 Blue Base Roomlight Packaged	**Clear Base Roomlight** EHC-10 Clear Base Roomlight Packaged
35 x 43 cm	828 1578	846 3366
35 x 35 cm	829 7038	830 3885
11 x 14 in.	833 9335	830 5831
8 x 10 in.	843 8350	834 1869

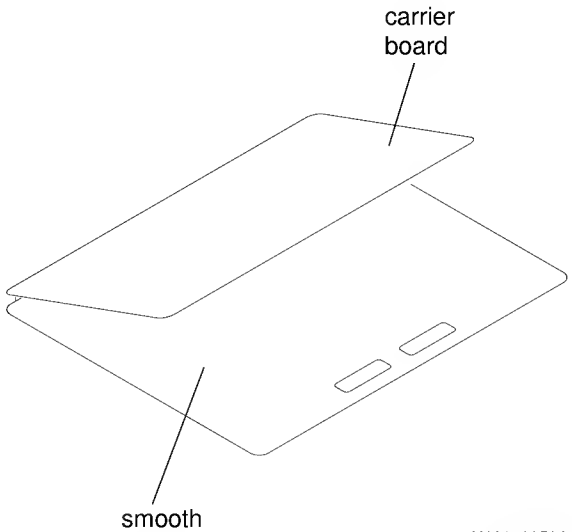
Appendix B - Folding the Reusable Plastic Carrier Board

For Darkroom Load Film Only

If changing the size of the film, the correct size Carrier Board must be used. If necessary, order the correct Carrier Board from Eastman Kodak Company, Service Parts Management.

35 x 43 cm Carrier Board	Part No. 968300
35 x 35 cm Carrier Board	Part No. 968301
11 x 14 in. Carrier Board	Part No. 968302
8 x 10 in. Carrier Board	Part No. 968303

[1] Fold the Carrier Board at the fold lines so that the smooth side is on the inside.



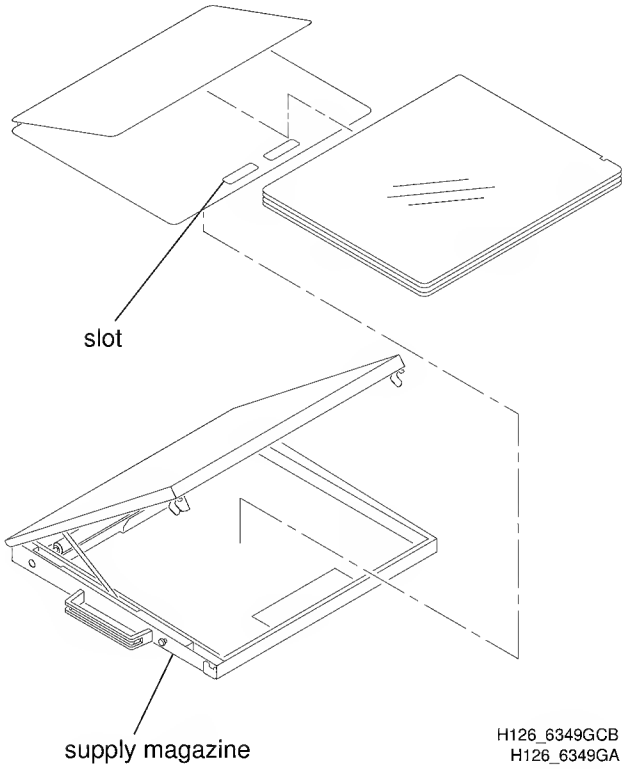
H126_6350ACB
H126_6350AA

[2] Load film into the Carrier Board with emulsion-side up.

[3] Place the Carrier Board and film into the *Kodak Ektascan* 2180 Laser Printer Supply Magazine.

Important

The slots in the Carrier Board will be on the bottom of the Supply Magazine and placed toward the opening.



Appendix C - Warranty Statement for the Processor

Kodak warrants this *Kodak X-Omat* 180 LP or 180 LPS Processor to function correctly for one year from the date of initial installation, when installed within one year from date of shipment.

Warranty Repair Coverage

If this equipment does not function correctly during the warranty period, the dealer (for *Kodak X-Omat* 180 LP or 180 LPS Processors) who sold the equipment will provide or arrange for repair of the equipment during the dealer's normal working hours. Such repair service will include any adjustments and/or replacement of parts required to maintain your equipment in good working order.

How to Obtain Service

Should the equipment require service, refer to the sales contract for details on whom to call for service, or contact the dealer (for *Kodak X-Omat* 180 LP or 180 LPS Processors) who sold the equipment to you.

Limitations

Warranty service is limited to the contiguous United States, the island of Oahu in Hawaii, and certain areas of Alaska. This warranty does not cover:

- circumstances beyond the control of Kodak
- misuse
- abuse
- attachments
- accessories
- alterations not marketed by Kodak (including service or parts to correct problems resulting from the use of such attachments, accessories, or alterations)
- failure to follow the operating instructions recommended by Kodak
- supply items

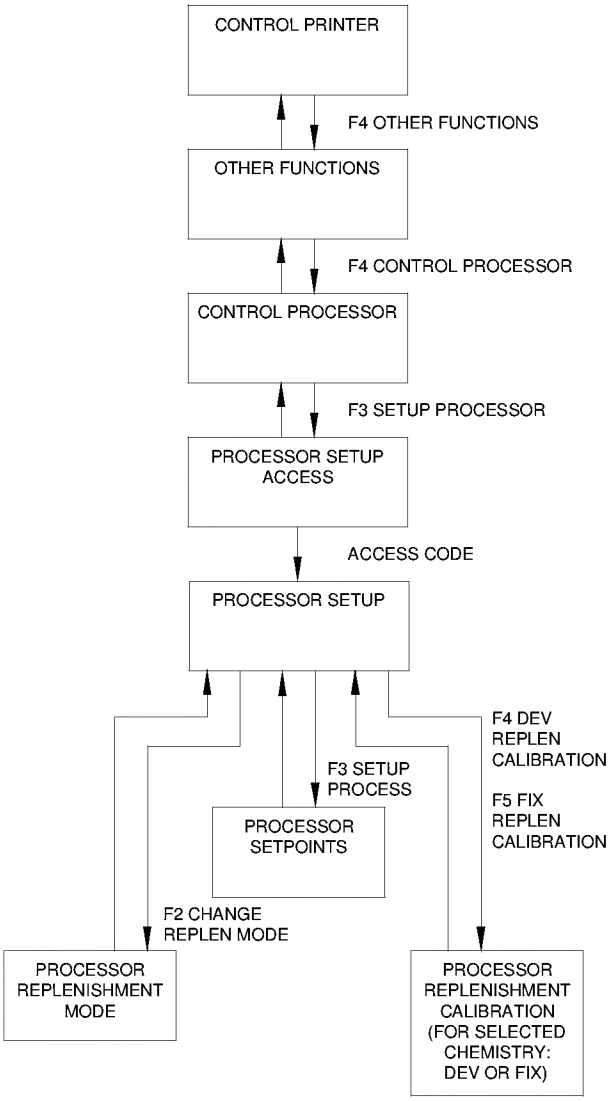
Kodak makes no other warranties, expressed or implied, for this equipment.

Repair without charge is the only obligation of both Kodak and the dealer under this warranty. Kodak will not be responsible for any consequential or incidental damages resulting from the sale, use, or improper functioning of this equipment, even if loss or damage is caused by the negligence or other fault of Kodak.

Such damages for which Kodak will not be responsible include, but are not limited to, loss of revenue or profit, downtime costs, loss of use of the equipment, cost of any substitute equipment, facilities or services or claims of your customers for such damages.

This limitation of liability will not apply to claims for injury to persons or damage to property caused by the sole negligence or fault of Kodak or by persons under its direction or control.

Appendix D - Processor Menu Flowchart



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Appendix E - Processor Error Messages

E001	PROCESSOR FATAL ERROR Call processor service. Select Receive Magazine. Films in processor will not be reprinted
E002	DRYER OVER TEMPERATURE Call processor service. Select Receive Magazine. Films in processor will not be reprinted.
E005	PROCESSOR AIR FLOW LOSS Call processor service. Select Receive Magazine.
E032	PROC DEV TANK FILL ERROR Check the developer delivery system. Call processor service. Select Receive Magazine.
E033	PROC FIXER TANK FILL ERROR Check the fixer delivery system. Call processor service. Select Receive Magazine.
E034	PROC DEV TEMP UNKNOWN Call processor service. Select Receive Magazine. Films in processor will not be reprinted.
E035	PROC FIX TEMP UNKNOWN Call processor service. Select Receive Magazine. Films in processor will not be reprinted.
E036	PROC DRYER TEMP UNKNOWN Call processor service. Select Receive Magazine. Films in processor will not be reprinted.
E037	PROC UNABLE TO HEAT DEV Call processor service. Select Receive Magazine. Films in processor will not be reprinted.
E038	PROC UNABLE TO COOL DEV Call processor service. Select Receive Magazine. Films in processor will not be reprinted.

E039	PROC UNABLE TO HEAT FIXER Call processor service. Select Receive Magazine. Films in processor will not be reprinted.
E040	PROC DRYER INOPERATIVE Call processor service. Select Receive Magazine.
E042	PROC COMMUNICATIONS ERROR Call processor service. Select Receive Magazine. Films in processor will not be reprinted.
E080	SORTER BIN ASSY NOT SENSED Replace/reseat processor sorter bin assembly or open processor cover to use film bypass tray.
E081	FILM BYPASS TRAY NOT SENSED Replace/install processor film bypass tray or close processor cover and install bin assembly.
E082	PROCESSOR SPEED ERROR If error repeats, select receive magazine. Call processor service.
E083	SORTER SPEED ERROR If error repeats, remove films and bin assembly. Open processor cover. Use bypass tray.
E091	SORTING ERROR AT BIN 1 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E092	SORTING ERROR AT BIN 2 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E093	SORTING ERROR AT BIN 3 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E094	SORTING ERROR AT BIN 4 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E095	SORTING ERROR AT BIN 5 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E096	SORTING ERROR AT BIN 6 Film may arrive at wrong bin or may be jammed in sorter. Remove film.

E097	SORTING ERROR AT BIN 7 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E098	SORTING ERROR AT BIN 8 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E099	SORTING ERROR AT BIN 9 Film may arrive at wrong bin or may be jammed in sorter. Remove film.
E101	SORTER FILM JAM AT BIN 1 Remove jammed film. If error repeats, call processor service.
E102	SORTER FILM JAM AT BIN 2 Remove jammed film. If error repeats, call processor service.
E103	SORTER FILM JAM AT BIN 3 Remove jammed film. If error repeats, call processor service.
E104	SORTER FILM JAM AT BIN 4 Remove jammed film. If error repeats, call processor service.
E105	SORTER FILM JAM AT BIN 5 Remove jammed film. If error repeats, call processor service.
E106	SORTER FILM JAM AT BIN 6 Remove jammed film. If error repeats, call processor service.
E107	SORTER FILM JAM AT BIN 7 Remove jammed film. If error repeats, call processor service.
E108	SORTER FILM JAM AT BIN 8 Remove jammed film. If error repeats, call processor service.
E109	SORTER FILM JAM AT BIN 9 Remove jammed film. If error repeats, call processor service.
E111	MIS-SORTED FILM AT BIN 1 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.

E112	MIS-SORTED FILM AT BIN 2 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E113	MIS-SORTED FILM AT BIN 3 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E114	MIS-SORTED FILM AT BIN 4 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E115	MIS-SORTED FILM AT BIN 5 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E116	MIS-SORTED FILM AT BIN 6 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E117	MIS-SORTED FILM AT BIN 7 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E118	MIS-SORTED FILM AT BIN 8 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E119	MIS-SORTED FILM AT BIN 9 Verify correct films in this bin. If error repeats, remove bin assembly and use bypass tray.
E128	PROC COVER NOT CLOSED Close processor cover.
W129	PROC TANKS BEING FILLED No action required.
W130	PROC REPLEN PUMPS DISABLED From Control Processor, Select Auto or Flooded replenishment. Films in proc not reprinted.
W132	PROC DEV UNDER SET TEMP Films in proc not reprinted. Printing to resume when temp ok. May override in Control Proc.
W133	PROC DEV OVER SET TEMP Films in proc not reprinted. Printing to resume when temp ok. May override in Control Proc.

W134	PROC DRYER UNDER SET TEMP Films in Proc not reprinted. Printing to resume when temp ok. May override in Control Proc.
W139	PROC EXIT SENSOR ERROR Check connector on dryer rack. Call processor service. Select Receive Magazine.
E211	Processor Error Fix the processor error or Select Receive Magazine.

Section 19: Glossary

Access Code: A 4-digit password which must be entered by a Service Representative or a key operator to set up the Processor or to change Processor *default* settings.

Audio: The Audio *menu* selection that allows you to specify a preference for audible feedback from the Keypad.

Autoclaving: Steam cleaning under pressure to sterilize.

Autofilming: Printer control (operations) is accessed through an imaging device's console or workstation.

Automatic Replenishment Mode: Replenishment solutions are added when an area of film equivalent to approximately 1500 cm^2 (240 $in.^2$) has been processed. For example, one 35 x 43 cm (14 x 17 in.) sheet of film.

Autoprint: The autoprint option allows you to specify that a *page* should be sent to the print queue automatically when the *page* format has been filled with *images*.

Auxiliary Keypad: Optional Keypad which can be used when an autofilming imaging device is connected to the Laser Printer. It provides additional functions over what is available through the imaging device console autofilming link.

Bilinear Interpolation: A method which uses the 4 bordering pixels (top, bottom, left and right) to create a new pixel that results in smoother edges of the images.

Bin: Located on the Sorter for the 180 LP or 180 LPS Processor, there are 9 Bins for collating films. Each Bin is identified with a number and a customer-written label naming the imaging device assigned to it.

Border Dmax: The Laser Printer specifies the maximum *density* of the *page* for each *page*. This is called the Border Dmax because black borders are printed at this *density*. The maximum *density* for an *image* on the *page* is typically the Border Dmax.

Calibrating: A process that compensates for changes in film emulsions, processor chemistry, or the printing system to deliver consistent *image* quality.

Cleared: Not all commands are appropriate in all situations. If a command is not appropriate in a particular situation, the command is cleared.

Common Text: Text which is printed at the bottom of all films for a particular imaging device. The text, which consists of 1 line of up to 80 characters, can contain the following types of information:

- date when the film was printed
- time when the film was printed
- film count within the study
- any other desired text

Control Terminal: The Control Terminal communicates with the Laser Printer to provide features that are not available from an autofilming imaging device. Similar in function to an Auxiliary Keypad.

Cubic Convolution: See *Cubic Spline*.

Cubic Spline: (*Cubic Convolution*) A method of *interpolation* that creates new pixel values based on a weighted average of the 16 neighboring *pixels*.

Curve Shape: A line or representation of the non-linear monitor characteristics. The curve shape selection is used to match the various brightness levels on the monitor so that images on film match the images on the monitor.

Decimation: Decimation reduces the *image* by decreasing the number of *image pixels*. It is mainly used for producing slides for projection.

Default: A preset value that is automatically assigned to a *field*/parameter when no value is specified.

Densitometer: A device used to measure film *density* by comparing the intensity of the light which enters an area on one side of a processed film with the intensity of that light as it emerges from the other side of the film.

Density: A measure of how black the film is.

D-Max: The highest printable *density*.

D-Min: The lowest printable *density*.

Drop Time: The time it takes the leading edge of a 35 x 43 cm sheet of film (fed 35 cm wide) to enter the Entrance Detector Rollers of the Processor and the trailing edge to exit the Dryer Rack of the Processor.

Ektascan: A trademark of the Eastman Kodak Company.

Field: An area on the *screen* where you enter data or data is displayed.

Film/Chemical: The combination of film type and chemicals that is required for optimum *image* quality when using the Processor.

Flooded Replenishment Mode: Developer and fixer replenishment volumes are 65 mL every 5 minutes and 65 mL for each 1500 cm^2 (240 $in.^2$) of film.

Image: Each picture that you take of a patient through a *imaging device* is called an image.

Image Buffer: Also referred to as CCU (Cluster Control Unit). A feature that is used as a storage area before the *image* is processed and printed. The Cluster Control Unit consists of a Master Circuit Board and up to 4 disk drives, located in the bottom of the Printer, that store *images*.

Imaging Device: A generic term for the imaging system (imaging device) that may include the scanner, imaging computer, and operator workstation.

Image Density Restriction: The Printer may specify a minimum and maximum density for the *images* on a *page*. The maximum *image density* may be lower than the black border density, and the minimum *image density* may be higher than the clear border density.

Image store rate: The sustained data rate of a Laser Printer for receiving and storing *images* from a *imaging device* until storage resources in the Laser Printer are filled.

Interface: Custom hardware and software which connects an imaging device to a 2180 Laser Printer.

Interpolation: Interpolation of an *image* results in an increased number of *pixels* for the *image*, and thus enlarges the *image* within the Laser Printer.

Job: A copy of a study in the print queue.

Laser: Light Amplification by Stimulated Emission of Radiation.

LUT: Look Up Table used to scale or convert digital *image* information from one *pixel* range to another, or to accomplish gray scale transformation (modify contrast).

Menu: A list of related options that you select to perform an action.

Modality: See *Imaging Device*. Modalities include Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Ultrasound (US), Nuclear Medicine (NM), Digital Subtraction Angiography (DSA), Digital Radiography (DR), and Computed Radiography (CR).

Option: A function that is listed on a *menu* that performs a certain action.

Page: *Images* are grouped to form a page which are displayed on one sheet of film.

Pixel: Picture element. The smallest printable area in an *image*. The number of bits per pixel determines how many gray levels are possible in the *image*. For instance, 2 bits/pixel equals to 4 gray levels, and 8 bits/pixel equals to 256 gray levels.

Process Time: The time that it takes the leading edge of a sheet of film to travel from the Entrance Detector Rollers of the Processor to the Exit Rollers of the Dryer Rack of the Processor.

Prompt: Symbol, text, or question which asks/allows a user to enter a command or response.

Replication: A method of *interpolation* of an *image* that creates new rows and columns of *pixels* next to and equal to the original *pixels*.

Reverse Video: An *image* or text is shown as white-on-black instead of the usual black-on-white. For example, a negative is a reverse video of an *image*.

Rotation: The rotation option allows you to have all *images* of a format rotated 90° clockwise.

Screen: The visible area on the display of a data terminal.

Scroll bar: Located on a *screen* that contains a list of items, the scroll bar shows the position of the items relative to the entire list.

Sorter: An accessory for the 180 LP or 180 LPS Processor to collate films into 9 Bins with a capacity to hold 50 films each. The Sorter accepts all film sizes, including mixed film sizes, at a rate of 180 films per hour. See also *Bin*.

Study: A study is a collection of *pages* for a patient that were all created during a single session.

Study Reprinting: A feature that provides the ability to reprint original patient studies after the patient has left the imaging area.

Tank Fill Mode: The Processor Tanks fill automatically with solution from the Replenishment Tanks until the Level Sensors detect that the Processor Tanks are full.

Throughput:	The number of 35 x 43 cm sheets of film (fed 35 cm wide) that can be processed in one hour.
Toggle:	Change between 2 settings. For example, a switch toggles from OFF to ON
Tone scaling:	A technique of making the printed *images* match the *images* on the input monitor.
X-Omat:	A trademark of the Eastman Kodak Company.

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